

# Exhibit A

***NIKE, INC.***  
***VS.***  
***SKECHERS U.S.A., INC.***



**Skechers' Technology Tutorial**

Samuel Lu  
Keith Orso  
Michael Rosen

July 12, 2024

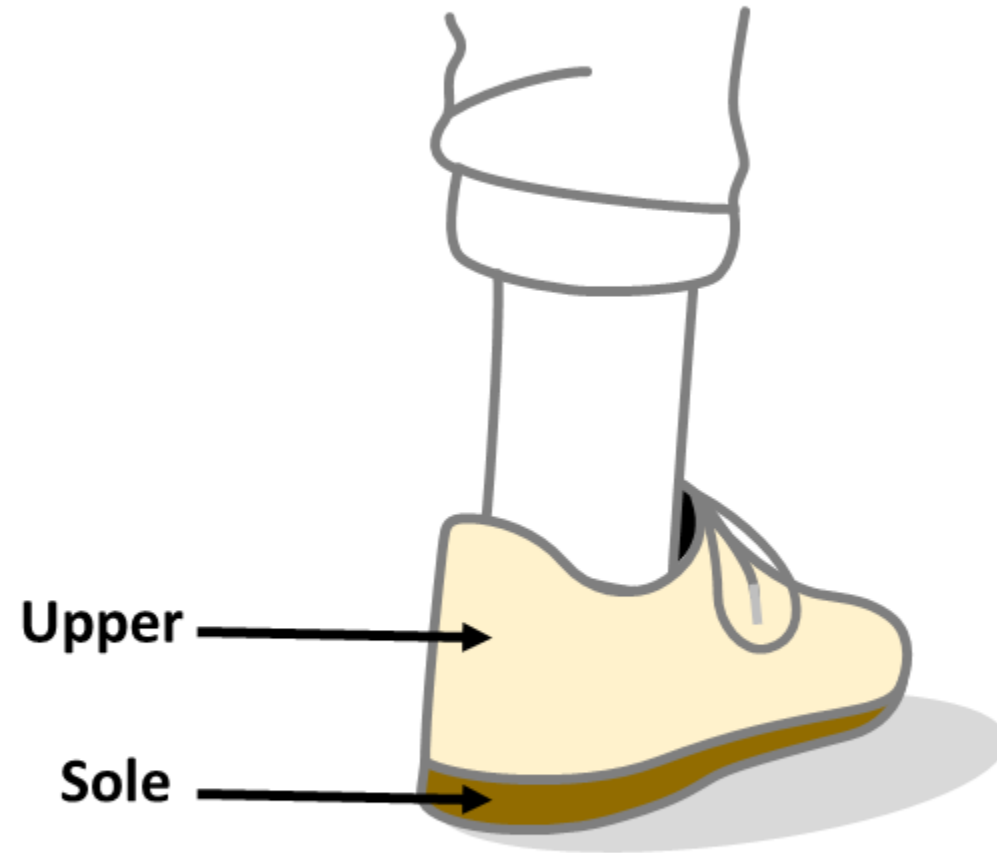
# Tutorial

## Footgear Terminology

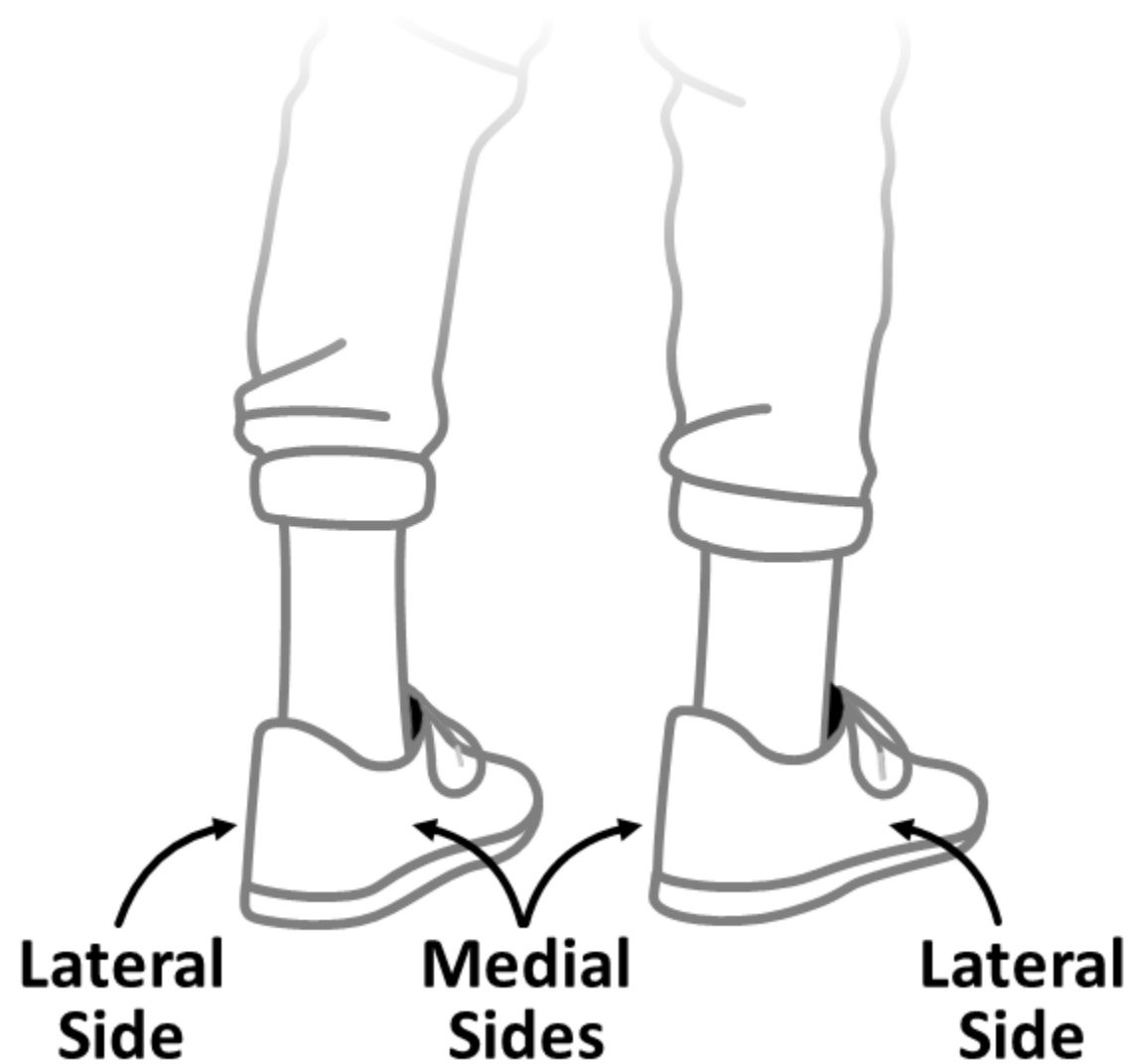
### Knitting Terminology

### Patents In Suit

# Major Components Of A Shoe



# Sides Of A Shoe



## Regions Of A Shoe

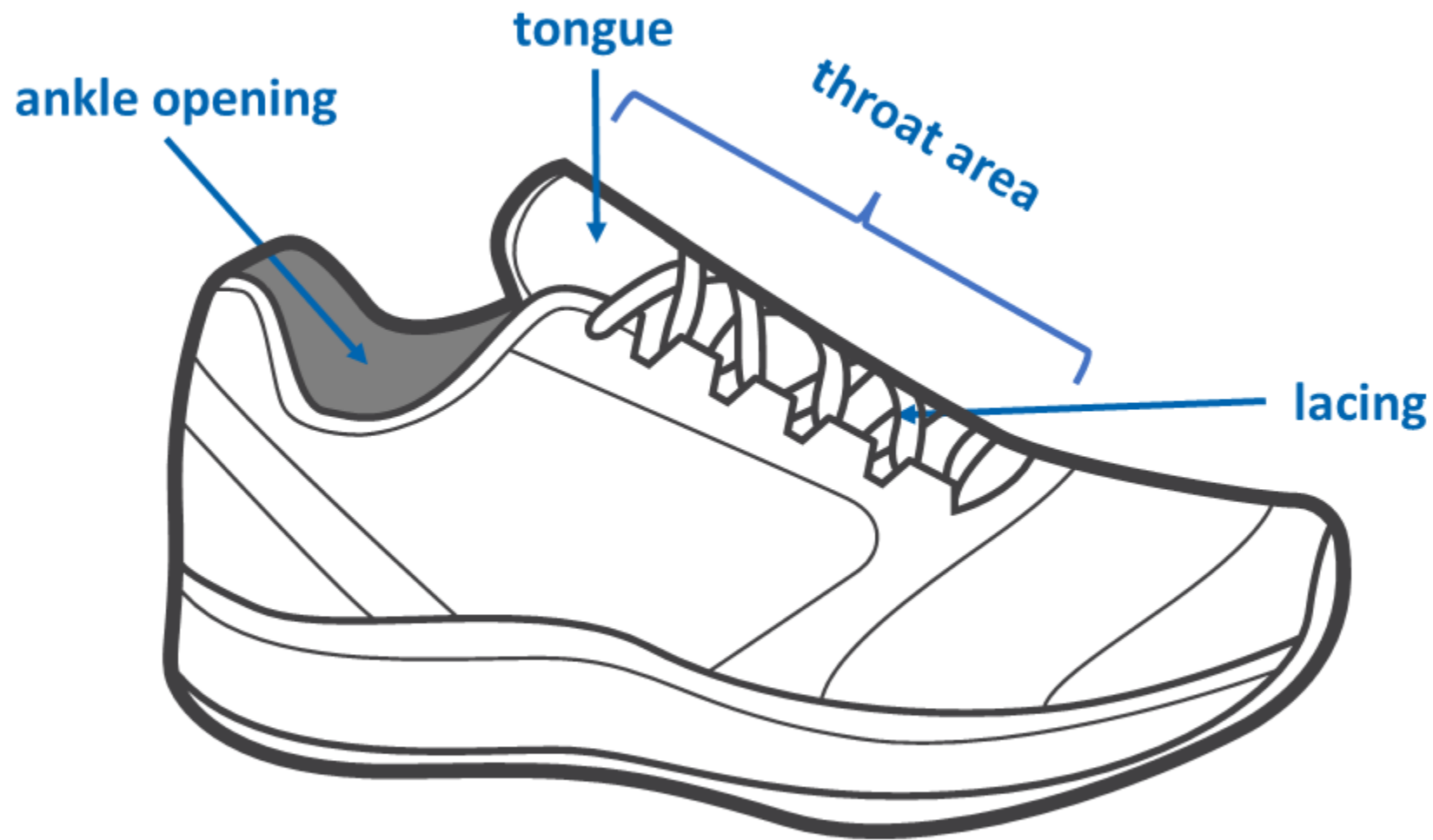


**heel region**

**midfoot region**

**forefoot region**

## Relevant Components Of An Upper



# Tutorial

Footgear Terminology

**Knitting Terminology**

Patents In Suit



# Patents At Issue Address Knitting Uppers



US 8,266,749 B2

'749

(12) **United States Patent**  
Dua et al.

(10) Patent No.: **US 8,266,749 B2**  
(45) Date of Patent: **\*Sep. 18, 2012**

(54) **ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER**

(73) Inventors: **Rajesh Dua, Portland, OR (US)**  
**Edward Nathaniel Thomas, Portland, OR (US)**

(79) Assignee: **Nike, Inc., Beaverton, OR (US)**

(\*) Notice: Subject to any disclaimer (the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days).  
This patent is subject to a terminal disclaimer.

(21) Appl. No.: **13/234,762**

(22) Filed: **Sep. 26, 2011**

(45) Prior Publication Date  
**US 2012/0009322 A1 Jan. 12, 2012**

Related U.S. Application Data  
(40) Continuation of application No. 12/879,517, filed on Sep. 18, 2010, now Pat. No. 8,062,286, which is a continuation of application No. 12/852,895, filed on Feb. 18, 2010, now Pat. No. 7,814,595, which is a division of application No. 12/761,265, filed on Mar. 5, 2010, now Pat. No. 7,347,611.

(51) Int. Cl.  
**A60 4/00 (2006.01)**  
(52) U.S. Cl.  
**12/145 C, 36/45**  
(53) Field of Classification Search  
**12/145 C, 36/45, 36/55, 36/56**  
See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS  
1,375,018 A 8/1926 Rogers  
1,388,472 A 6/1922 Jahn  
1,992,780 A 3/1933 Holden et al.

1,000,251 A 5/1910 Jahn  
1,081,261 A 5/1913 Wallace  
1,097,719 A 7/1916 Richardson  
1,147,197 A 11/1916 Gishler  
1,156,896 A 5/1917 McDermott  
1,158,189 A 6/1917 Smith  
1,480,687 A 5/1946 Hubert  
1,487,137 A 4/1948 Shuman et al. 12/145 C  
1,530,271 A 1/1951 Donaldson  
1,546,847 A 2/1952 Hays  
2,641,884 A 6/1953 Rogers et al.

## FOREIGN PATENT DOCUMENTS

CN 1467566 1/1993  
(Continued)

## OTHER PUBLICATIONS

Reuter, S.p.A. publication, Knitting News 1940 Sep 1 (7 pages)  
(Continued)

Primary Examiner — Marie Paterson  
(74) Attorney, Agent, or Firm — Banner & Witbeck LLP

## ABSTRACT

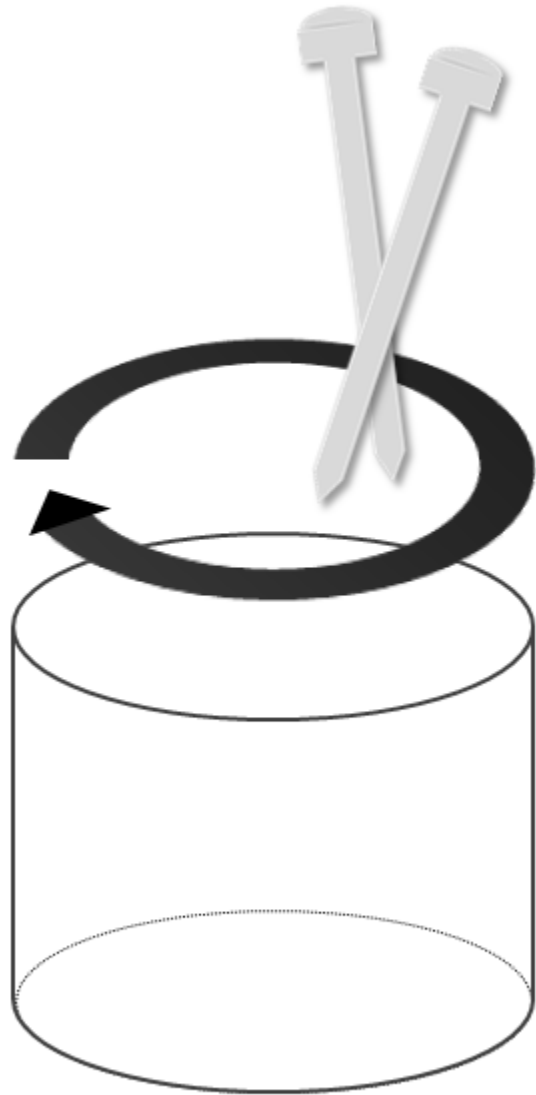
An article of footwear and a method of manufacturing the article of footwear are disclosed. The footwear may include an upper and sole structure. The upper incorporates a textile element with edges that are joined together to define at least a portion of a wall for enclosing a foot. The textile element may also have a first area and a second area with a stitch configuration. The first area is formed of a first stitch configuration, and the second area is formed of a second stitch configuration that is different from the first stitch configuration to impart varying textures to a surface of the textile element. Various warp knitting or weft knitting processes may be utilized to form the textile element.

21 Claims, 12 Drawing Sheets

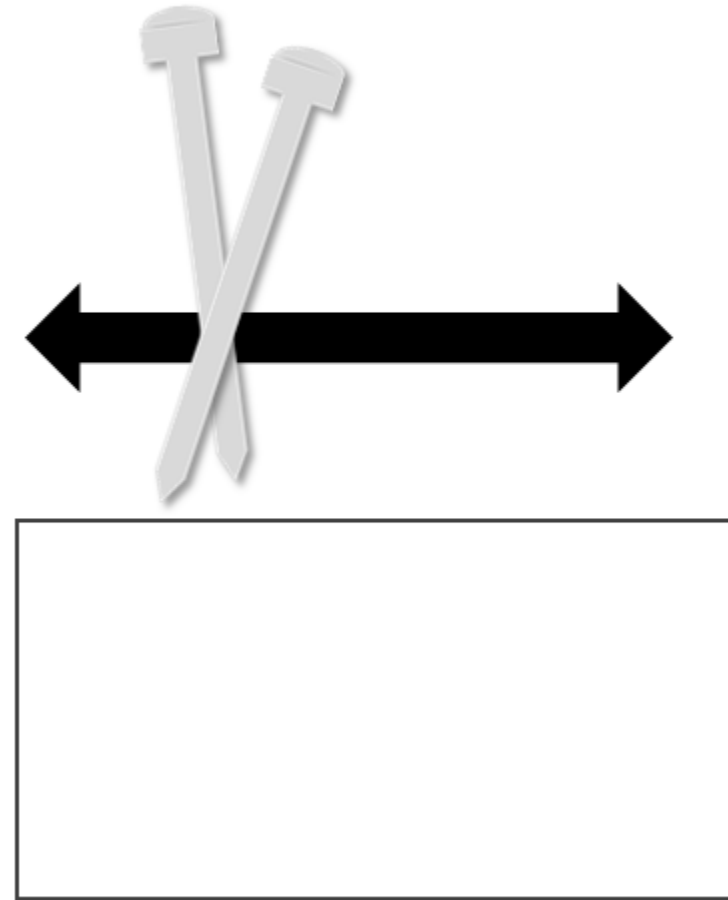


## SUMMARY OF THE INVENTION

The present invention is an upper for an article of footwear, the upper incorporating a textile element formed with a knitting machine, for example. In one aspect of the invention, the



**Circular Knitting Machine**



**Flat Knitting Machine**

“Another suitable knitting machine for forming textile element **40** is a wide-tube circular knitting machine that is produced in the Lonati Group by Santoni S.p.A. of Italy under the SM8 TOP1 model number.... A wide-tube circular knitting machine, as produced by Santoni S.p.A., forms a generally cylindrical textile structure and is capable of forming various types of stitches within a single textile structure.”



“An example of a textile structure **60** that may be formed with a wide-tube circular knitting machine is depicted in FIG. 9.”

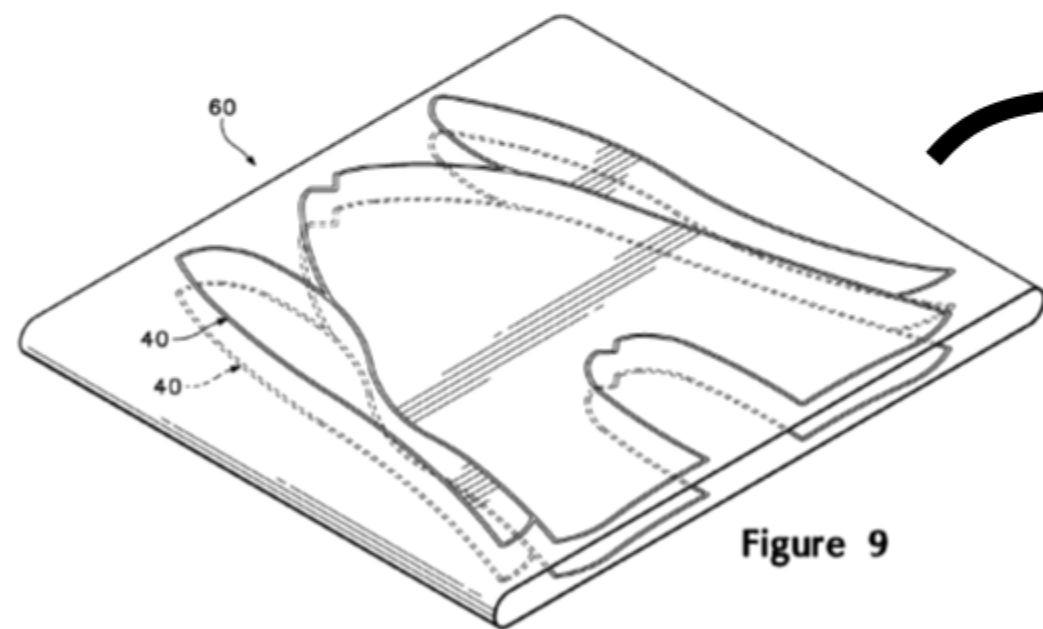
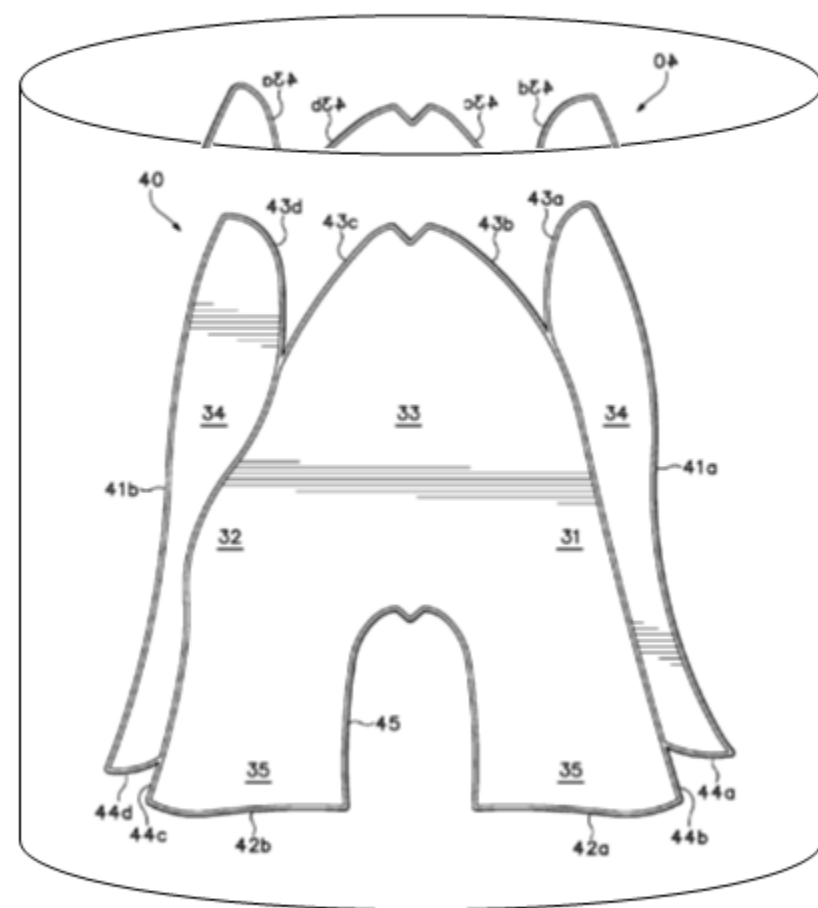


Figure 9



United States Patent [19]  
Ikenaga

[11] Patent Number: 5,031,423  
[45] Date of Patent: Jul. 16, 1991

[54] PATTERN CONTROL DEVICE FOR FLAT KNITTING MACHINES

[75] Inventor: Katsuyoshi Ikenaga, Arita, Japan

[73] Assignee: Ikenaga Co., Ltd., Arita, Japan

[21] Appl. No.: 475,967

[22] Filed: Feb. 6, 1990

[30] Foreign Application Priority Data

Jan. 6, 1989 [JP] Japan 1-73193

Aug. 31, 1989 [JP] Japan 1-225943

[51] Int. Cl. D04B 7/24

[52] U.S. Cl. 66/126 R

[53] Field of Search 66/126 R, 126 A

[54] References Cited

U.S. PATENT DOCUMENTS  
3,650,127 3/1972 Nistroj et al. 66/126 R  
3,673,819 7/1972 Swannick et al. 66/126 R  
4,321,807 3/1982 Strong 66/126 R  
4,340,120 2/1987 Schuler  
4,658,603 4/1987 Stoll et al. 66/126 R  
4,724,685 2/1988 Stoll et al.

FOREIGN PATENT DOCUMENTS

44-12212 5/1989 Japan  
56-140543 11/1981 Japan

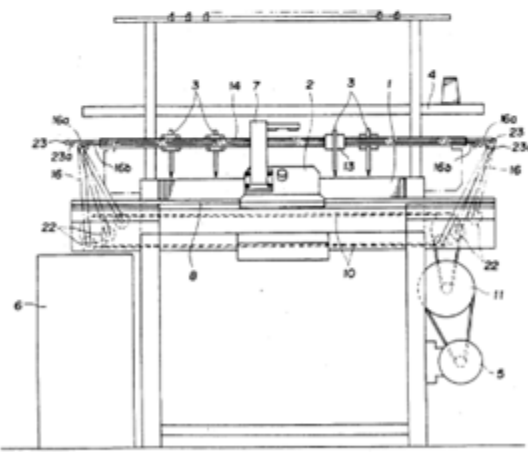
322392 1/1985 Japan 66/126 R  
61-51061 11/1986 Japan  
62-50589 10/1987 Japan

Primary Examiner—Werner H. Schroeder  
Assistant Examiner—John J. Calvert  
Attorney, Agent, or Firm—Felt, Jacobson, Cohn, Price,  
Holmes & Stern

[57] ABSTRACT

A pattern control device for flat knitting machines including knitting needle control carriages (2) adapted to be moved laterally along carriage guide rails (8) by a driving motor (5) via a toothed resilient belt (19), a plurality of yarn guide support plates (13) which retain yarn guide supports (18) provided with feeders (12) in such a manner that the yarn guide supports (18) can be vertically moved, and which are provided so that the yarn guide supporting plates (13) can be moved laterally along yarn guide supporting plate guide rails (14) by their respective guide driving motors (22) via toothed resilient belts (16a, 16b), and a control unit is used to control the yarn guide supporting plates (13) provided with yarn guides (3) for supporting yarn required for a knitting operation selectively in concurrence with the movements of the carriages (2).

6 Claims, 10 Drawing Sheets

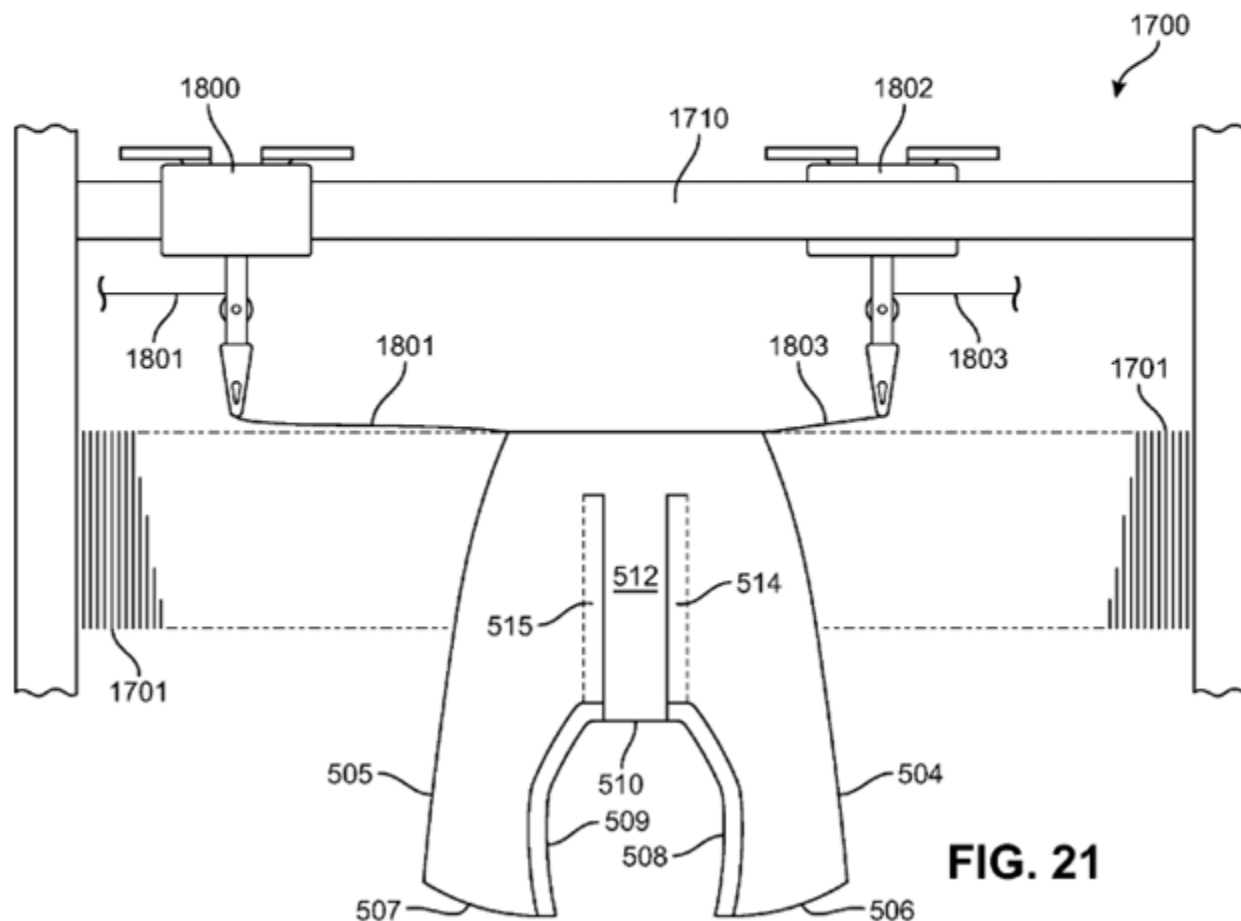


*Prior art cited by Nike's patents include:*

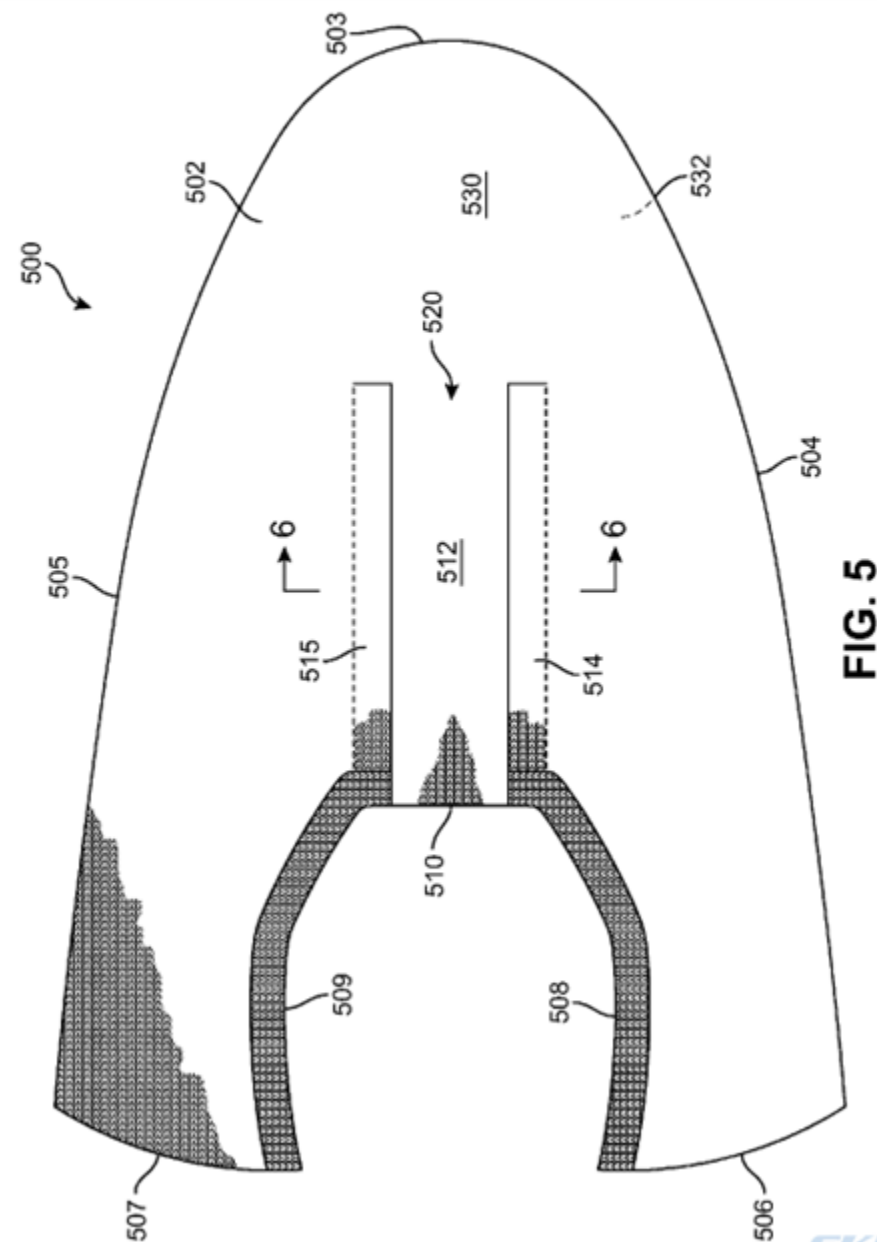
[54] PATTERN CONTROL DEVICE FOR FLAT KNITTING MACHINES

[45] Date of Patent: Jul. 16, 1991

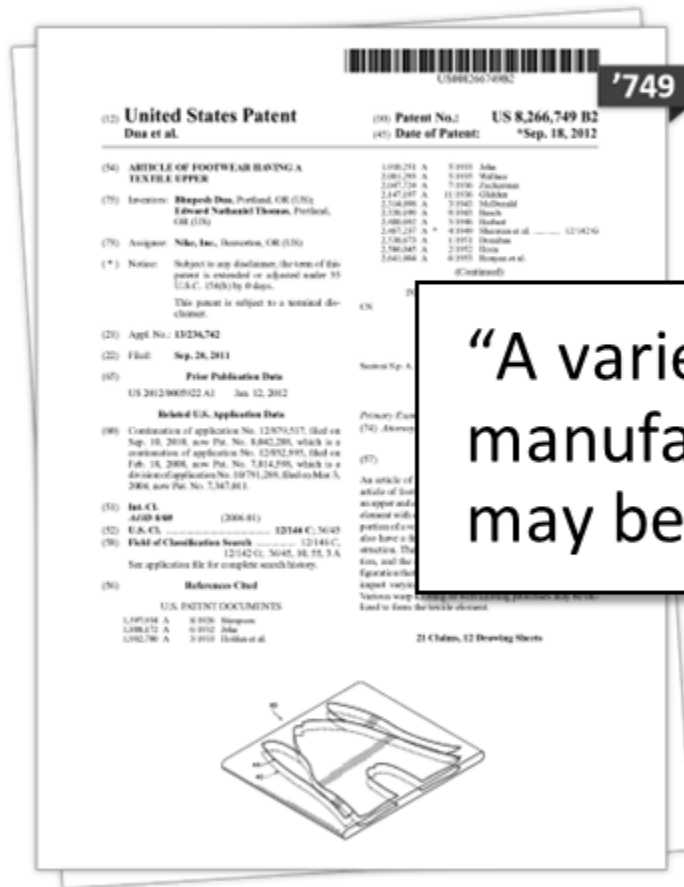
“FIG. 21 illustrates knitting machine **1700** nearly completing the knitting process of forming first knitted component **500**.”



“Referring now to FIG. 5, an exemplary embodiment of a first knitted component **500** is shown in a top plan view.”





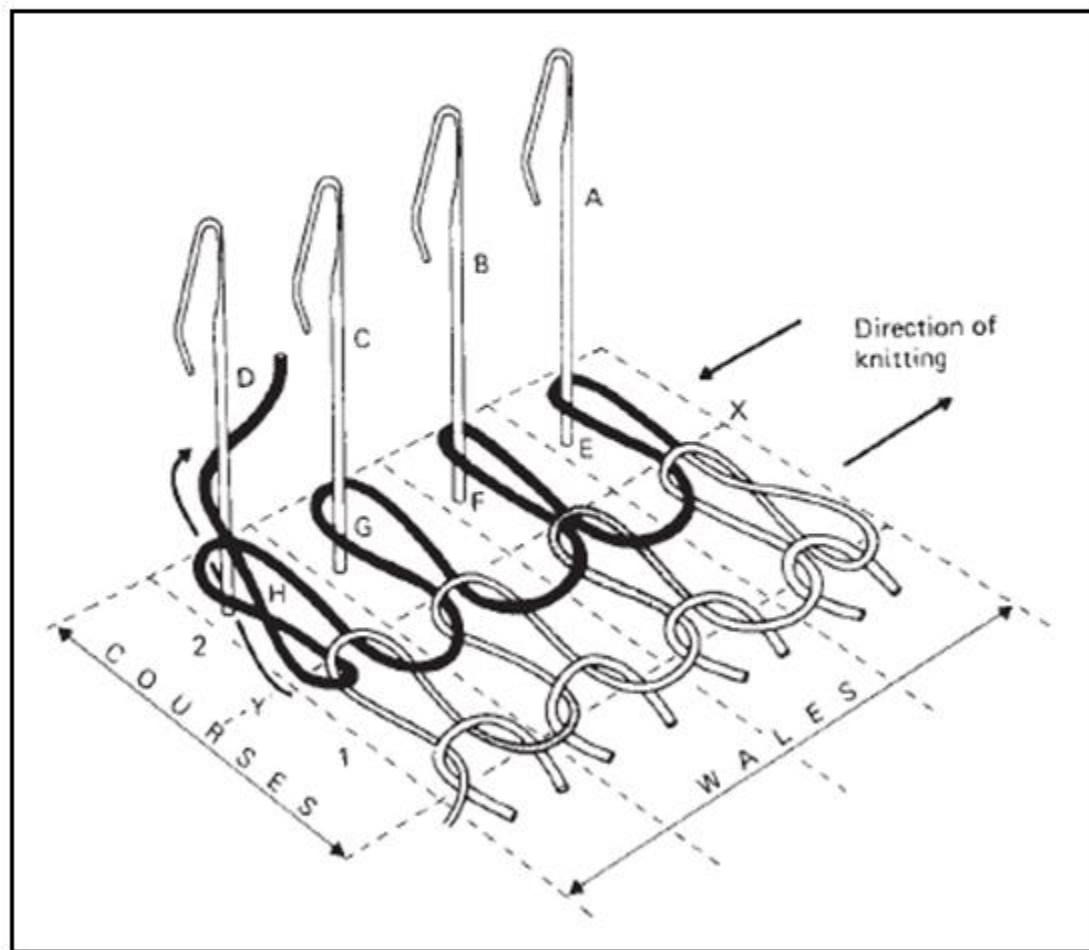


“A variety of mechanical processes have been developed to manufacture a textile. In general, the mechanical processes may be classified as either warp knitting or weft knitting.”

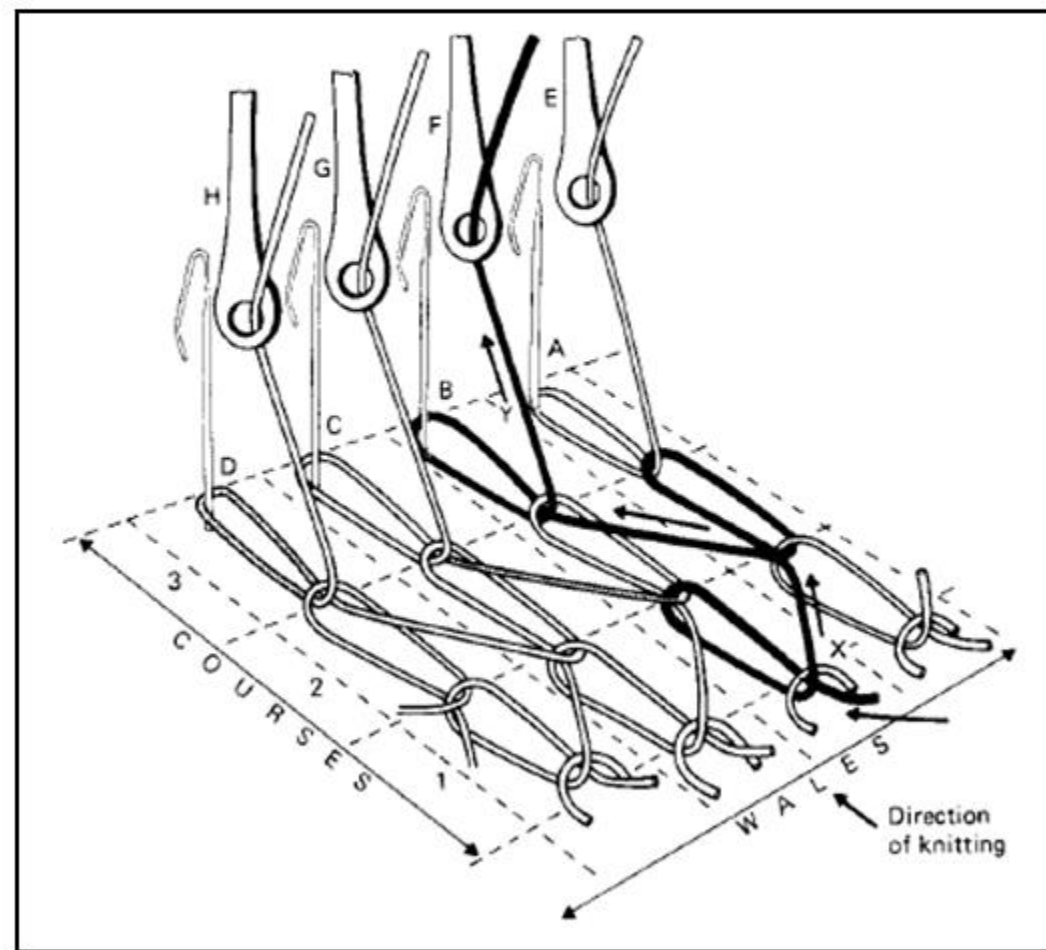


# Two Main Types Of Knitting

## Weft Knitting



## Warp Knitting



# Knitting Machines Can Create Different Textures In Different Areas

“That is, the type of stitch that is formed at each location on the textile structure may be selected by programming the wide-tube circular knitting machine such that specific needles either accept or do not accept yarn at each stitch location. In this manner, various patterns, textures, or designs may be selectively and purposefully imparted to the textile structure.”

“Various types of stitches may also be formed with other types of knitting machines.”

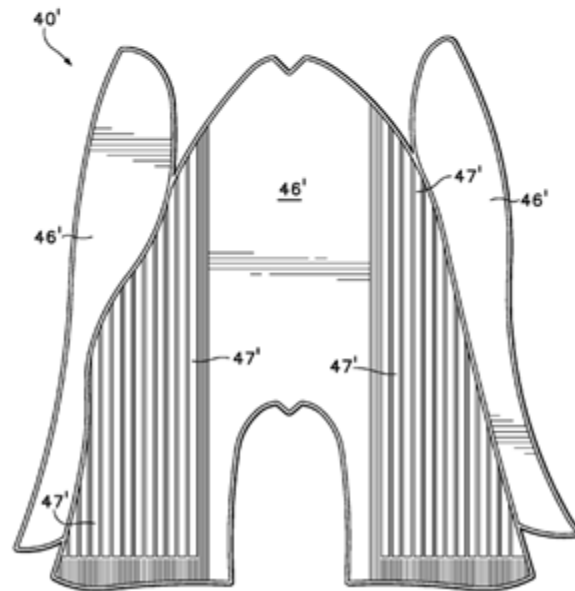


Figure 10

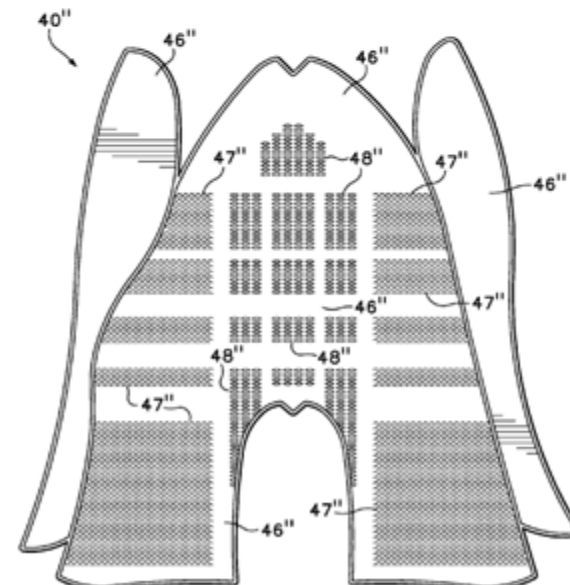


Figure 11

“A variety of material elements (e.g., textiles, polymer foam, polymer sheets, leather, synthetic leather) are conventionally used in manufacturing the upper. ... In order to impart the different properties to different areas of the upper, material elements are often cut to desired shapes and then joined together, usually with stitching or adhesive bonding.”



“As the number and type of material elements incorporated into the upper increases, the time and expense associated with transporting, stocking, cutting, and joining the material elements may also increase.

Waste material from cutting and stitching processes also accumulates to a greater degree as the number and type of material elements incorporated into the upper increases. Moreover, uppers with a greater number of material elements may be more difficult to recycle than uppers formed from fewer types and numbers of material elements.”

“By decreasing the number of material elements used in the upper, therefore, waste may be decreased while increasing the manufacturing efficiency and recyclability of the upper.”



“Each textile element **40** is then removed from textile structure **60** with a die-cutting, laser-cutting, or other conventional cutting operation. Once textile element **40** is removed from textile structure **60**, seams **51-54** may be formed and textile element **40** may be incorporated into footwear **10**.”

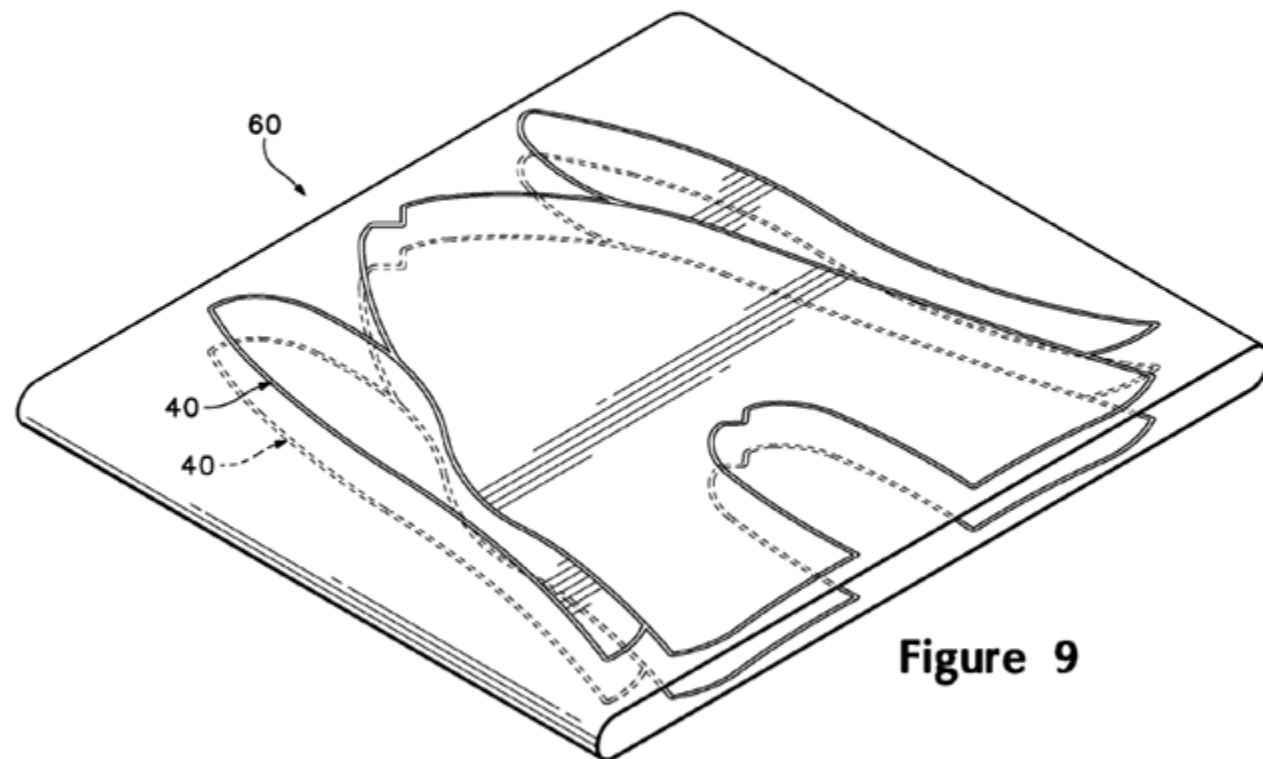
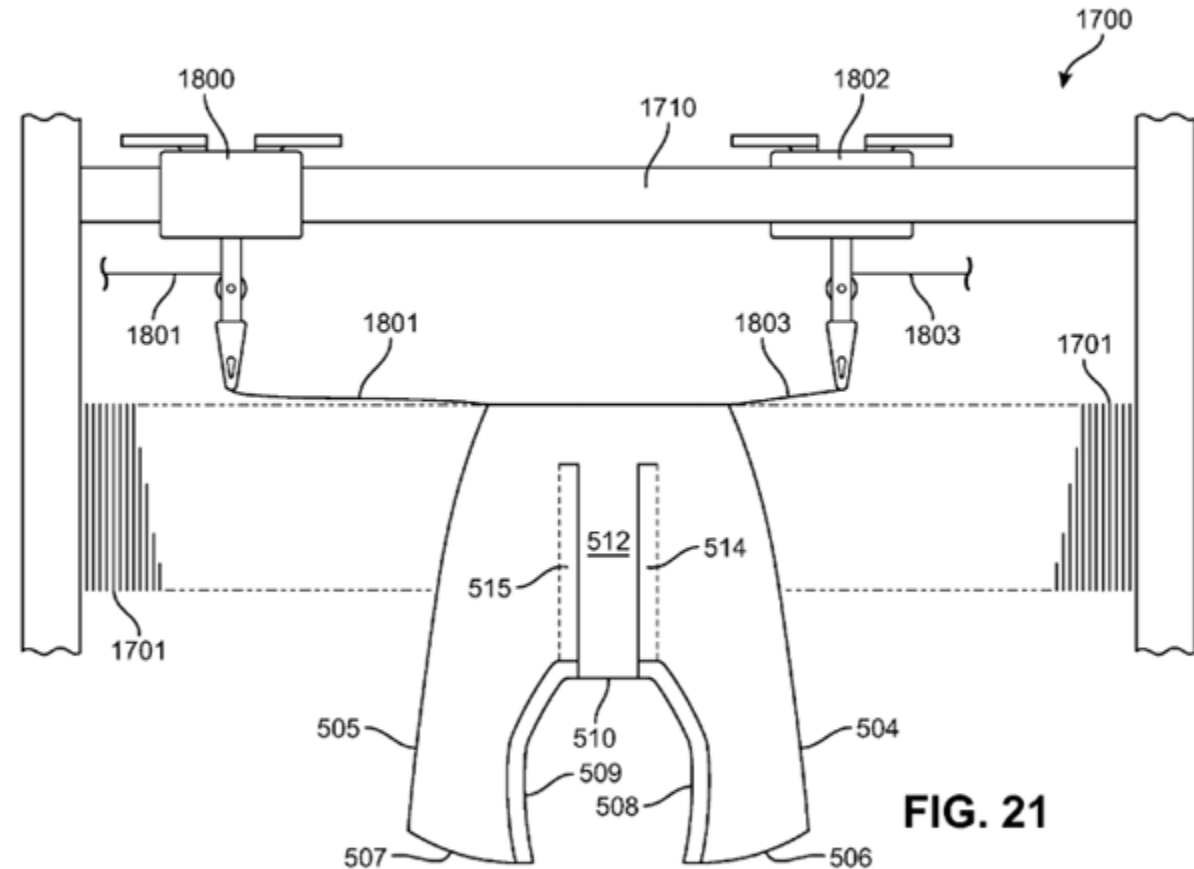


Figure 9

# Flat Knitting To “A Final Desired Shape” Is Even More Advantageous

“Flat knitting, when used in example structures according to this invention, can provide various advantages. For example, flat knitting can be used to provide textile structures for use in footwear uppers of ***a final desired shape*** such that textile cutting steps can be avoided (which eliminates waste, avoids the need to finish cut edges, saves time, saves money, etc.).”



# Tutorial

Footgear Terminology

Knitting Terminology

**Patents In Suit**





'511

'781



'636



**SKECHERS** 24



US009986781B2

'781

(12) **United States Patent**  
**Dua et al.**

(10) **Patent No.:** US 9,986,781 B2  
(45) **Date of Patent:** Jun. 5, 2018

(54) **ARTICLE OF FOOTWEAR HAVING A  
TEXTILE UPPER**

(71) Applicant: **NIKE, Inc.**, Beaverton, OR (US)

(72) Inventors: **Bhupesh Dua**, Portland, OR (US);  
**Edward Nathaniel Thomas**, Portland,  
OR (US)

(73) Assignee: **NIKE, Inc.**, Beaverton, OR (US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 9 days.

(21) Appl. No.: 15/616,089

(22) Filed: May 31, 2017

(55) **Prior Publication Data**

US 2017/0258172 A1 Sep. 14, 2017

**Related U.S. Application Data**

(50) Continuation of application No. 14/505,514, filed on  
Oct. 1, 2014, now Pat. No. 9,743,765, which is a  
(Continued)

(51) **Int. Cl.**  
**A41B 1/04** (2006.01)  
**D04B 21/20** (2006.01)

(Continued)

(52) **U.S. CL.**  
**CPC** — **A41B 1/04** (2013.01); **A41B 5/065**  
(2013.01); **A41B 9/02** (2013.01); **A41B 23/027**  
(2013.01);

(Continued)

(58) **Field of Classification Search**  
**CPC** — **A41B 1/00**; **A41B 1/02**; **A41B 1/04**; **A41B**  
**23/00**; **A41B 23/025**; **A41B 23/0265**  
(Continued)

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

601,392 A 3/1908 Woodside

761,520 A 5/1904 Mathew

(Continued)

**FOREIGN PATENT DOCUMENTS**

DE 870603 3/1993

DE 1004173 6/1960

(Continued)

**OTHER PUBLICATIONS**

Petitioner's Reply to Patent Office's Response for Inter Patent  
Review (IPR2016-00521) dated Apr. 28, 2017, 32 pages.  
(Continued)

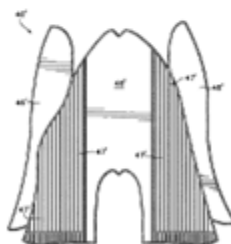
**Primary Examiner** — Marie Bays

(74) **Attorney, Agent, or Firm** — Shook, Hardy & Bacon  
L.L.P.

(57) **ABSTRACT**

An article of footwear and a method of manufacturing the  
article of footwear are disclosed. The footwear may include  
an upper and a sole structure. The upper incorporates a  
textile element with edges that are joined together to define  
at least a portion of a void for receiving a foot. The textile  
element may also have a first area and a second area with a  
unitary construction with varying stitch configurations. The  
upper may also incorporate longitudinal ribs extending  
along the lateral and/or medial sides of the upper. Various  
weave knitting or welt knitting processes may be utilized to  
form the textile element.

20 Claims, 12 Drawing Sheets



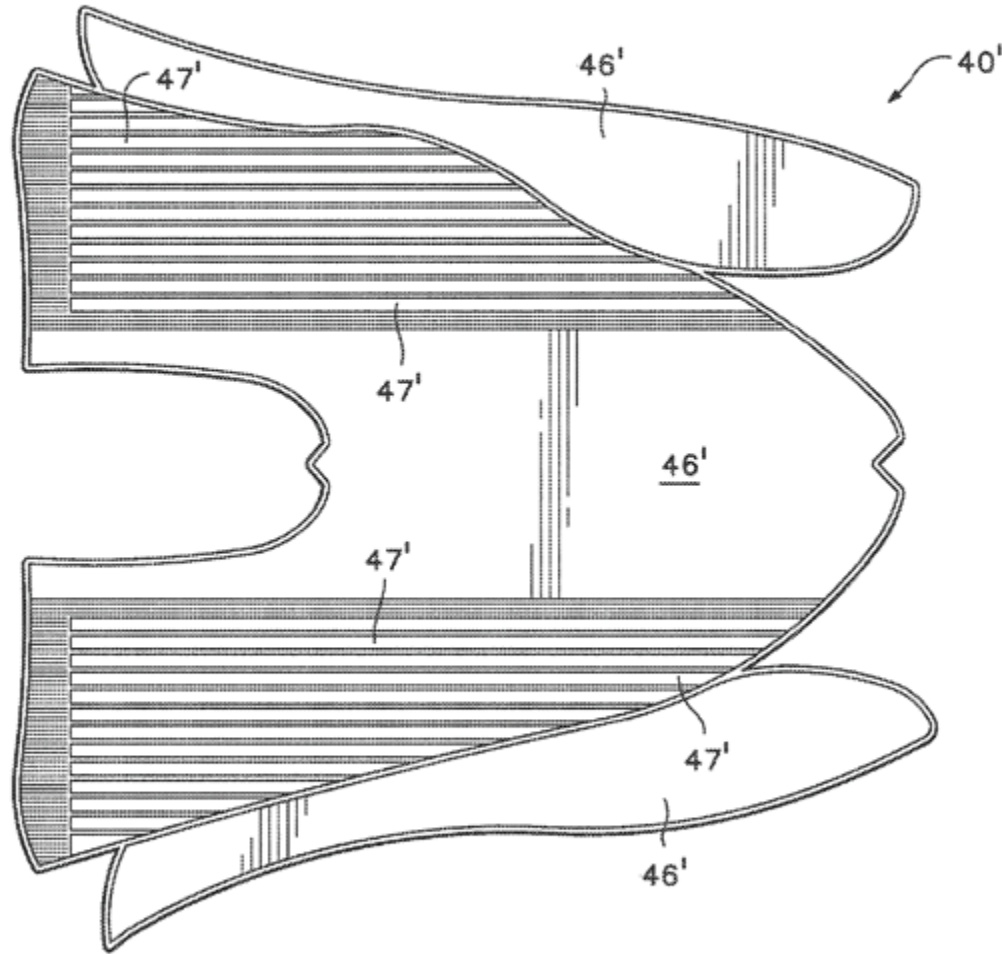
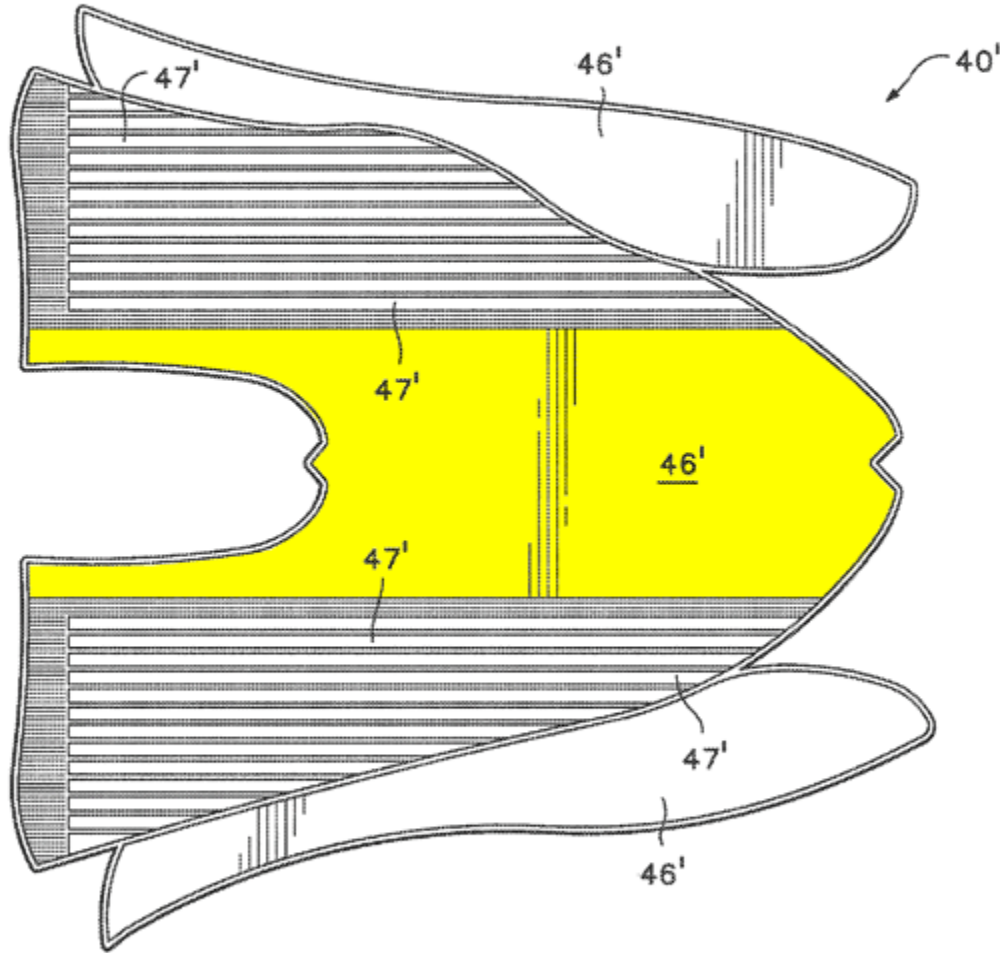


Figure 10

“[T]he textile element has a first area and a second area .... The first area is formed of a first stitch configuration, and the second area is formed of a second stitch configuration that is different from the first stitch configuration to impart varying textures to a surface of the textile element.”

“With reference to FIG. 10, a textile element **40'** ... is depicted as having various areas with different textures.”



“For example, a central area that corresponds with instep region **33** has a first texture **46'** that is generally smooth.”

Figure 10

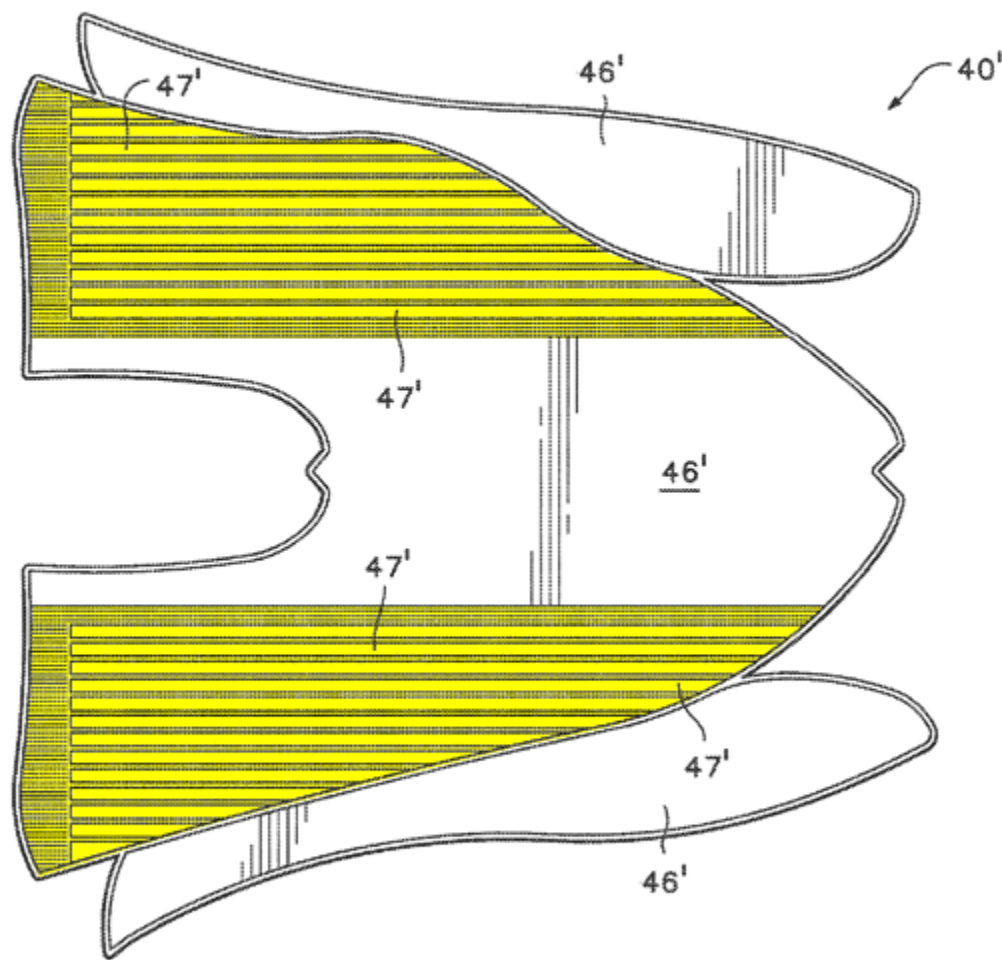


Figure 10

“[T]extile element **40'** includes a second texture **47'** that is a plurality of longitudinal ribs. When incorporated into footwear **10**, the ribs will extend longitudinally along lateral region **31** and medial region **32**, and the ribs may extend into heel region **35**.”

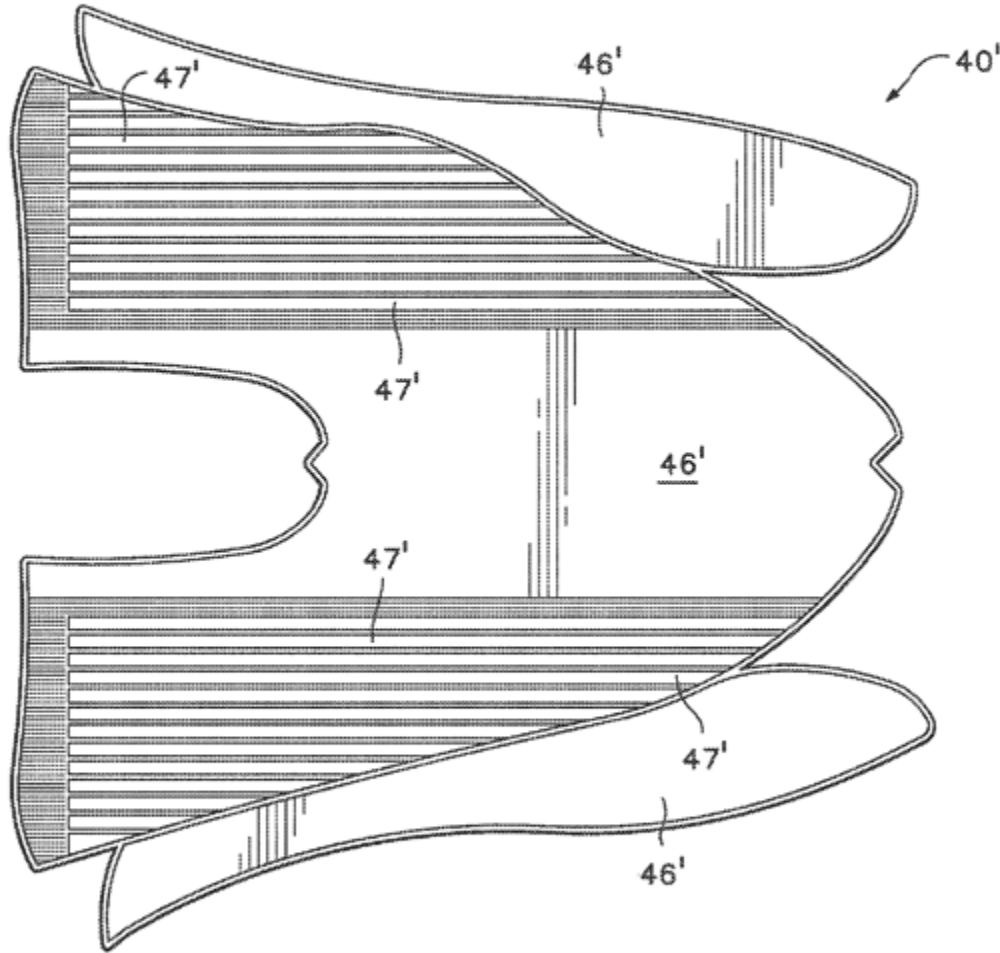


Figure 10

“The ribs may be present for aesthetic purposes, or may affect the stretch properties of upper **20**, for example.”





**GOLDTOE®**

EST. 1934

**Gold Toe Socks: “Featuring a  
...ribbed design to stay in  
place all day...”**

# '781 Patent Claims Longitudinally Ribbed Texture

'781

(12) **United States Patent**  
Dua et al.

(10) **Patent No.:** US 9,986,781 B2  
(45) **Date of Patent:** Jun. 5, 2018

(54) **ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER**

(71) **Applicant:** NIKE, Inc., Beaverton, OR (US)

(72) **Inventors:** Bhupesh Dua, Portland, OR (US); Edward Nathaniel Thomas, Portland, OR (US)

(73) **Assignee:** NIKE, Inc., Beaverton, OR (US)

(\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** 15/810,009

(22) **Filed:** May 31, 2017

(65) **Prior Publication Data**  
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**Related U.S. Application Data**

(90) **Continuation of application No. 14/503,514, filed on Oct. 1, 2014, now Pat. No. 9,743,765, which is a (Continued)**

(31) **Int. Cl.**  
A41B 1/04 (2006.01)  
D04B 21/20 (2006.01)  
(Continued)

(52) **U.S. Cl.**  
CPC ..... A41B 1/04 (2013.01); A41B 7/00 (2013.01); A41B 8/02 (2013.01); A41B 25/02 (2013.01);  
(Continued)

(58) **Field of Classification Search**  
CPC ..... A41B 1/00; A41B 1/02; A41B 1/04; A41B 23/00; A41B 23/0205; A41B 23/0265  
(Continued)

**References Cited**  
U.S. PATENT DOCUMENTS  
606,192 A 3/1908 Woodside  
791,520 A 5/1908 Mathew  
(Continued)

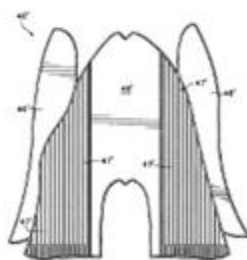
**FOREIGN PATENT DOCUMENTS**  
DE 470953 5/1993  
DE 1004173 6/1990  
(Continued)

**OTHER PUBLICATIONS**  
Petitioner's Reply to Patent Owner's Response for Inter Partes Review IPR(2016-08021) dated Apr. 21, 2017, 32 pages.  
(Continued)

**Primary Examiner** — Marie Boys  
(74) **Attorney, Agent, or Firm** — Shook, Hardy & Bacon L.L.P.

(57) **ABSTRACT**  
An article of footwear and a method of manufacturing the article of footwear are disclosed. The footwear may include an upper and a sole structure. The upper incorporates a textile element with edges that are joined together to define at least a portion of a void for receiving a foot. The textile element may also have a first area and a second area with a unitary construction with varying stitch configurations. The upper may also incorporate longitudinal ribs extending along the lateral and/or medial sides of the upper. Various warp knitting or weft knitting processes may be utilized to form the textile element.

**20 Claims, 12 Drawing Sheets**



1. An upper for an article of footwear, the upper comprising:

a flat knit textile element having: (1) flat knit edges free of surrounding textile structure such that the flat knit edges are not surrounded by textile structure from which the textile element must be removed, and (2) a plurality of ribs integrally knitted into the flat knit textile element,

wherein one or more ribs extend longitudinally along one or more of a lateral side and a medial side of the upper, the one or more ribs extending from the forefoot region toward the heel region and terminating in one of the midfoot region or the heel region.



# Corresponding Regions From The Claims

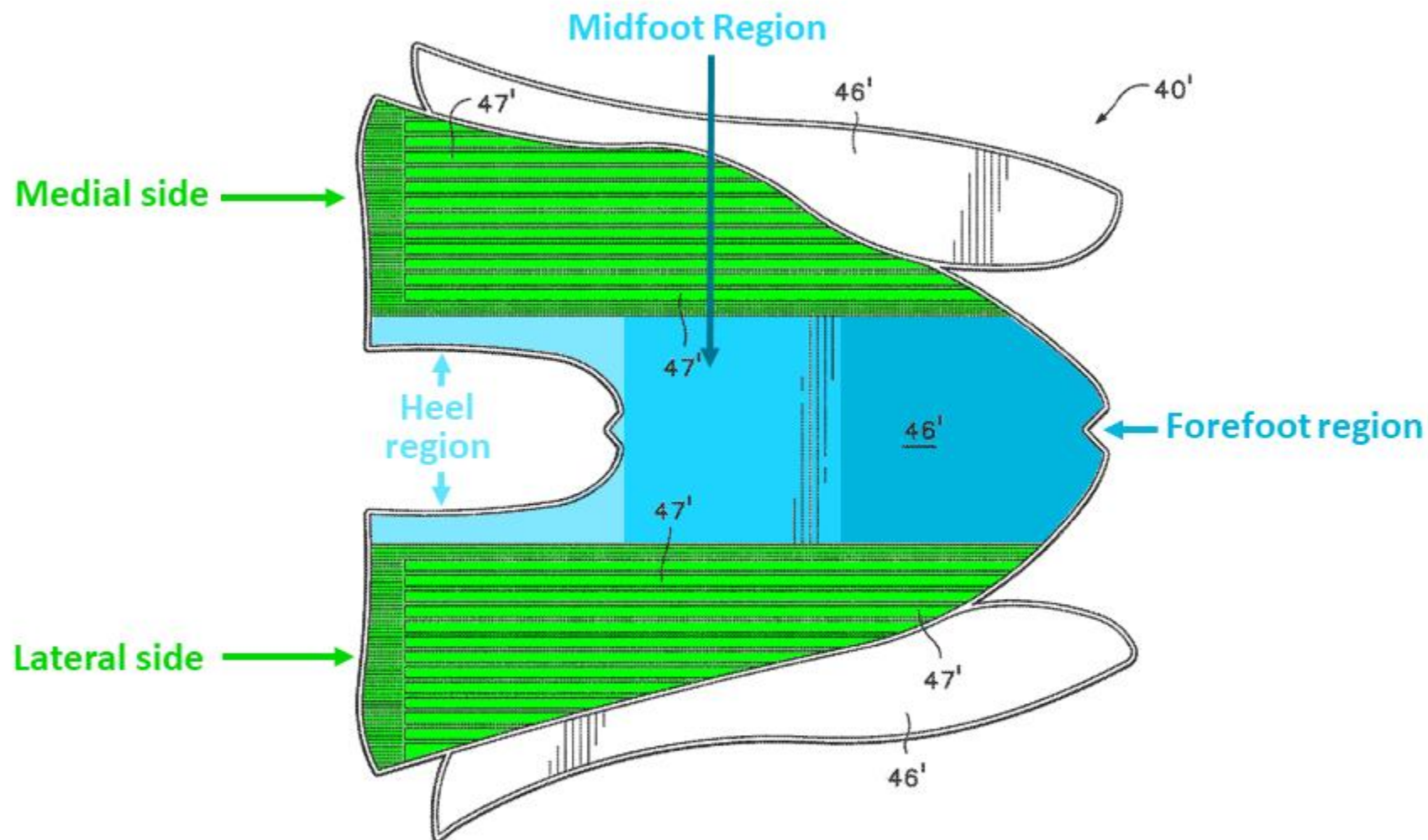


Figure 10

*These labels apply to a right-footed upper; otherwise, the lateral and medial labels would switch.*



US008266749B2

'749

(12) **United States Patent**  
**Dua et al.**

(10) **Patent No.:** **US 8,266,749 B2**  
(45) **Date of Patent:** **\*Sep. 18, 2012**

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(21) **Appl. No.:** **13/236,742**

(22) **Filed:** **Sep. 28, 2011**

(65) **Prior Publication Data**  
US 2012/0005922 A1 Jan. 12, 2012

**Related U.S. Application Data**  
(60) Continuation of application No. 12/979,517, filed on Sep. 10, 2010, now Pat. No. 8,042,288, which is a continuation of application No. 12/032,995, filed on Feb. 18, 2008, now Pat. No. 7,814,598, which is a division of application No. 10/791,289, filed on Mar. 3, 2004, now Pat. No. 7,347,011.

(51) **Int. Cl.**  
**A23D 1/00** (2006.01)

(52) **U.S. Cl.** **12/146 C; 36/45**

(58) **Field of Classification Search** **12/146 C; 12/142 G; 36/45; 10; 55; 3 A**  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**  
1,597,934 A 8/1926 Simpson  
1,888,172 A 6/1932 John  
1,992,780 A 3/1933 Glendon et al.

1,910,250 A 5/1933 John  
2,001,203 A 5/1935 Walker  
2,047,724 A 5/1936 Jackson  
2,547,897 A 11/1950 Glendon  
2,514,898 A 3/1951 McDonald  
2,530,496 A 9/1951 Busch  
2,600,692 A 5/1954 Harbert  
2,607,237 A \* 4/1954 Shorrock et al. 12/142 G  
2,538,673 A 1/1951 Dondos  
2,586,045 A 2/1952 Ilina  
2,641,004 A 6/1953 Remy et al.

(Continued)

**FOREIGN PATENT DOCUMENTS**

CN 1067566 1/1993  
(Continued)

**OTHER PUBLICATIONS**

National S.p.A. publication: Knitting Wear, SMB Top 1 (7 pages).

(Continued)

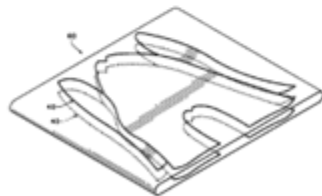
**Primary Examiner — Marie Patterson**

(74) **Attorney, Agent, or Firm —** Banner & Witcoff, Ltd.

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**21 Claims, 12 Drawing Sheets**



(54) **ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER**

'511

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(30) Patent No.: **US 9,918,511 B2**  
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(73) Assignee: **NIKE, Inc.**, Beaverton, OR (US)

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This patent is subject to a terminal disclaimer.

(21) Appl. No.: **15/644,587**

(22) Filed: **Jul. 31, 2017**

(65) **Prior Publication Data**  
US 2017/0325535 A1 Nov. 16, 2017

**Related U.S. Application Data**  
(90) Continuation of application No. 15/610,089, filed on May 31, 2017, which is a continuation of application (Continued)

(51) **Int. Cl.**  
**A41B 1/04** (2006.01)  
**A41B 9/02** (2006.01)  
(Continued)

(52) **U.S. Cl.**  
CPC **A41B 1/04** (2013.01); **A41B 5/085** (2013.01); **A41B 9/02** (2013.01); **A41B 23/027** (2013.01);  
(Continued)

(58) **Field of Classification Search**

CPC **A41B 1/04**; **A41B 23/00**; **A41B 23/025**; **A41B 23/0255**; **A41B 23/04**; **A41B 7/06**; **A41B 7/08**; **A41B 7/085**

(Continued)

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

691,892 A 3/198 Woodside  
761,520 A 5/1994 Mathew  
(Continued)

**FOREIGN PATENT DOCUMENTS**

DE 472063 3/1993  
DE 1004173 6/1993  
(Continued)

**OTHER PUBLICATIONS**

Bord, P., "Grid Design Assets", Design, Inc. 1999, 4 pages.  
(Continued)

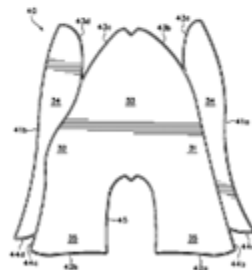
**Primary Examiner**—Marie Hays

(74) **Attorney, Agent, or Firm**—Shook, Hardy & Bacon, L.L.P.

(57) **ABSTRACT**

An article of footwear and a method of manufacturing the article of footwear are disclosed. The footwear may include an upper and a sole structure. The upper incorporates a textile element with edges that are joined together to define at least a portion of a void for receiving a foot. The textile element may have a first area with a first property and a second area with a second property. Various warp or weft knitting processes, including flat knitting, may be utilized to form the textile element.

20 Claims, 12 Drawing Sheets



(54) **ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER**

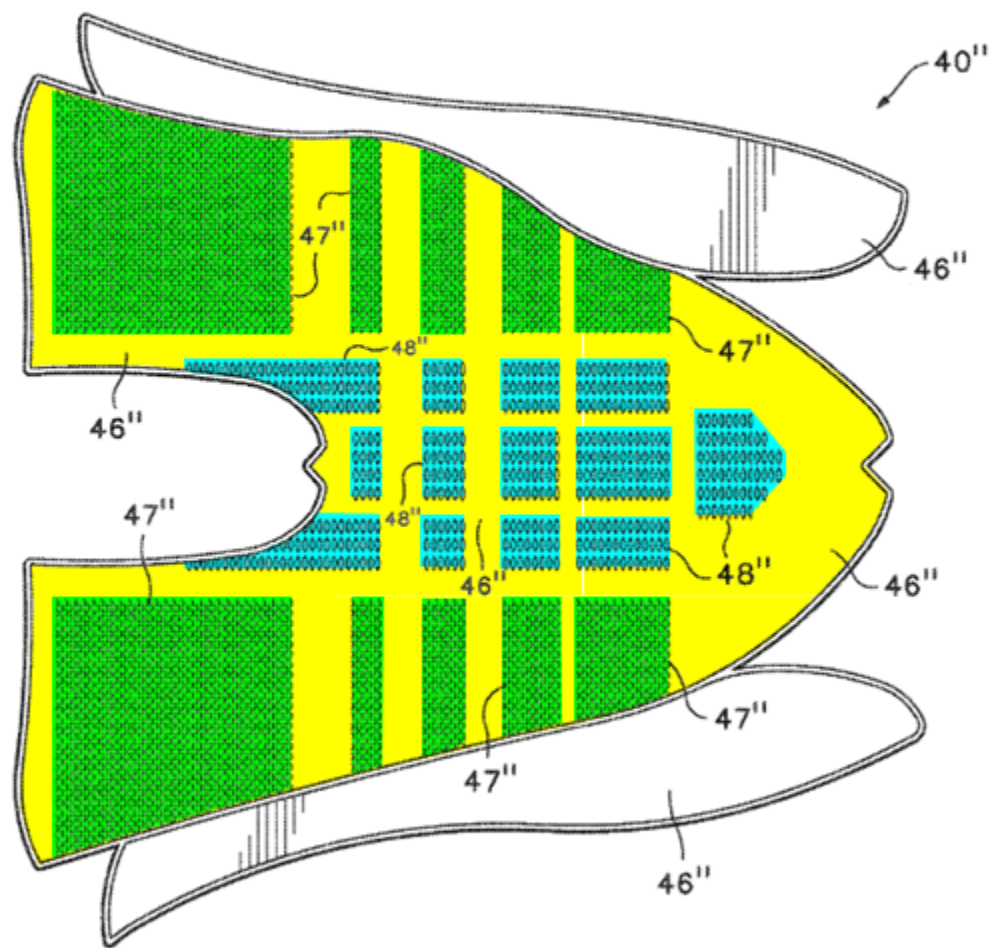


Figure 11

“Textile element **40''** includes areas with three different textures. A first texture **46''** is generally smooth... a second texture **47''**, which is generally rough in comparison with first texture **46''**...[and] a third texture **48''**.”

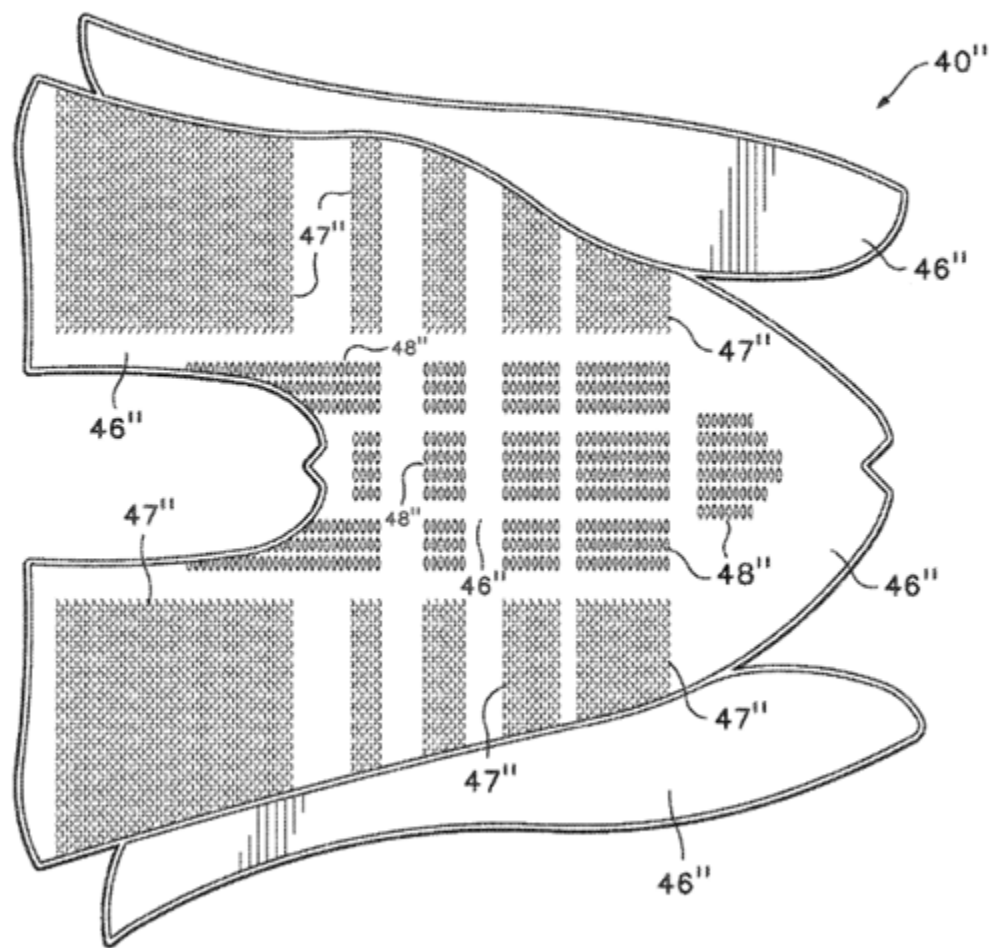


Figure 11

"The different textures **46''-48''** are formed by merely varying the type of stitch formed by the wide-tube circular knitting machine at each location of textile element **40''**."



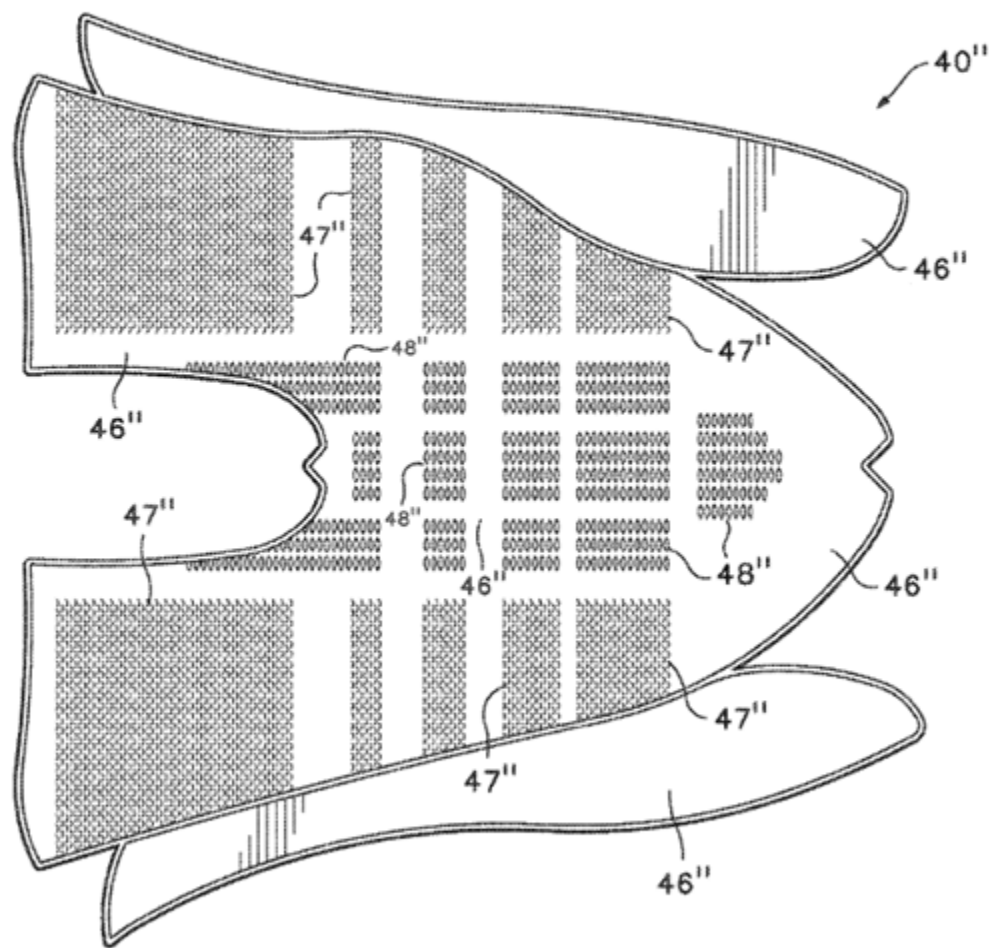


Figure 11

"Textures **46''-48''** may exhibit aesthetic differences, or the differences may be structural.... Accordingly, the various stitches ... may be utilized to vary the texture, physical properties, or aesthetics of footwear **10** ...."

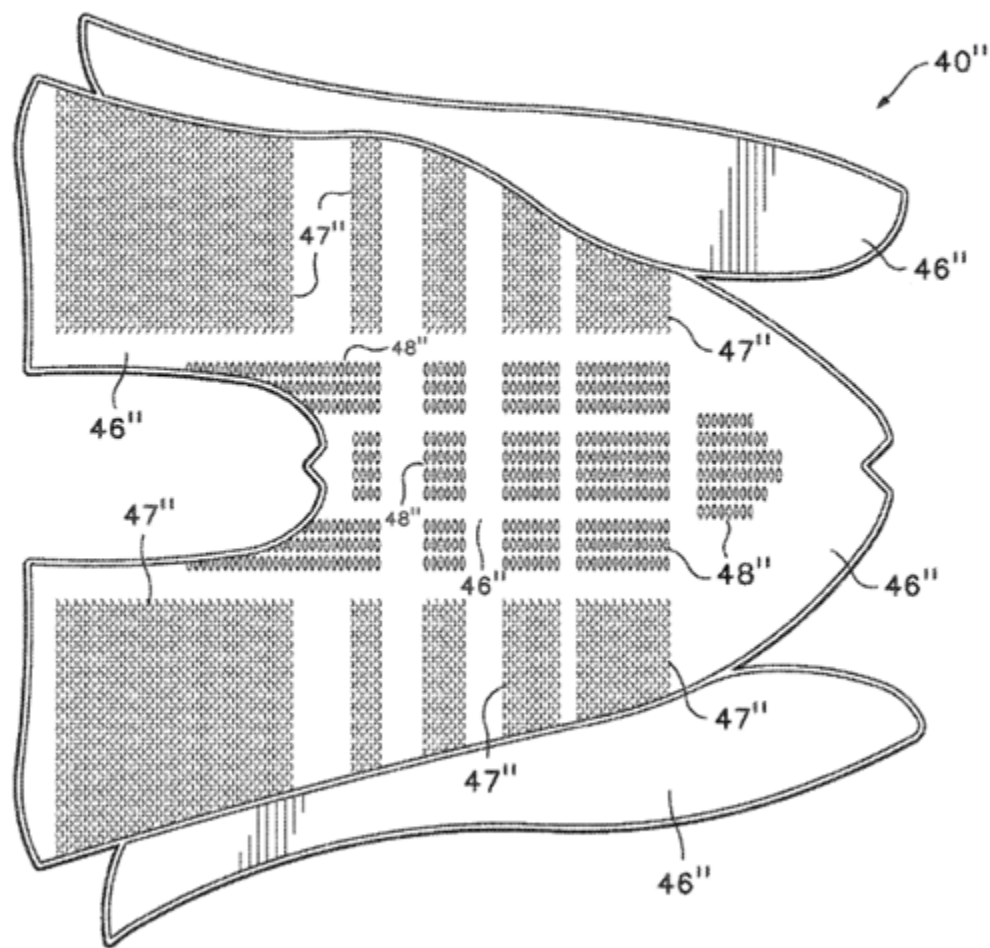


Figure 11

“For example, the **degree of stretch** in areas with textures **46''-48''** may be different, or the **wear resistance** of the areas may vary depending upon the stitch utilized. The **air-permeability** of textile element **40''** may also vary in the different areas.”



**GOLDTOE®**

EST. 1934

**Gold Toe Socks: “Featuring a  
...ribbed design to stay in  
place all day...”**



'511

(12) **United States Patent**  
**Dua et al.**

(36) **Patent No.:** US 9,918,511 B2  
(45) **Date of Patent:** \*Mar. 20, 2018

(54) **ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER**

(71) **Applicant:** NIKE, Inc., Beaverton, OR (US)

(72) **Inventors:** Bhupesh Dua, Portland, OR (US);  
Edward Nathaniel Thomas, Portland, OR (US)

(73) **Assignee:** NIKE, Inc., Beaverton, OR (US)

(\* ) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) **Appl. No.:** 15/644,587

(22) **Filed:** Jul. 31, 2017

(65) **Prior Publication Data**  
US 2017/0325535 A1 Nov. 16, 2017

**Related U.S. Application Data**  
(90) Continuation of application No. 15/610,089, filed on May 31, 2017, which is a continuation of application (Continued)

(51) **Int. Cl.**  
**A41B 1/04** (2006.01)  
**A41B 9/02** (2006.01)  
(Continued)

(52) **U.S. Cl.**  
CPC **A41B 1/04** (2013.01); **A41B 5/085** (2013.01); **A41B 9/02** (2013.01); **A41B 23/027** (2013.01)  
(Continued)

(58) **Field of Classification Search**

CPC **A41B 1/04**; **A41B 23/00**; **A41B 23/025**; **A41B 23/0255**; **A41B 23/04**; **A41B 7/06**; **A41B 7/08**; **A41B 7/085**

(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

60,892 A 3/198 Woodside  
76,528 A 5/1984 Matthew  
(Continued)

FOREIGN PATENT DOCUMENTS

DE 47063 3/1993  
DE 1004173 6/1963  
(Continued)

OTHER PUBLICATIONS

Burd, P., "Grid Design Assets", Design, Inc. 1989, 4 pages.  
(Continued)

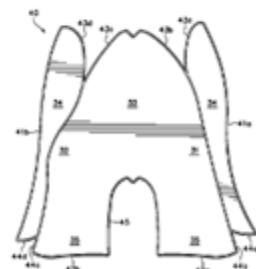
**Primary Examiner** — Marie Hays

(74) **Attorney, Agent, or Firm** — Shock, Hardy & Bacon, L.L.P.

(57) **ABSTRACT**

An article of footwear and a method of manufacturing the article of footwear are disclosed. The footwear may include an upper and a sole structure. The upper incorporates a textile element with edges that are joined together to define at least a portion of a void for receiving a foot. The textile element may have a first area with a first property and a second area with a second property. Various warp or weft knitting processes, including flat knitting, may be utilized to form the textile element.

20 Claims, 12 Drawing Sheets



“[T]he type of yarn utilized in various areas of textile elements **40'** and **40''** may be changed to impart different properties .... For example, ***elastane*** may be utilized to impart stretch, wool may be utilized for insulation, and nylon may be utilized for durability.”



**GOLDTOE®**  
EST. 1934

- “Spandex [(elastane)] for a Perfect Fit”
- “[W]hen you see our iconic, reinforced gold toe, you know these socks were built to last.”

# '749 Patent Claims Focus On Different Textures

'749

(12) **United States Patent**  
**Dua et al.**

(10) **Patent No.:** **US 8,266,749 B2**  
(45) **Date of Patent:** **\*Sep. 18, 2012**

(54) **ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER**

(75) **Inventors:** **Bhupesh Dua**, Portland, OR (US);  
**Edward Nathaniel Thomas**, Portland, OR (US)

(73) **Assignee:** **Nike, Inc.**, Beaverton, OR (US)

(\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.  
This patent is subject to a terminal disclaimer.

(21) **Appl. No.:** **13/236,742**

(22) **Filed:** **Sep. 28, 2011**

(65) **Prior Publication Data**  
US 2012/0005922 A1 Jan. 12, 2012

**Related U.S. Application Data**  
(60) Continuation of application No. 12/979,517, filed on Sep. 10, 2010, now Pat. No. 8,042,288, which is a continuation of application No. 12/032,995, filed on Feb. 18, 2008, now Pat. No. 7,814,598, which is a division of application No. 10/791,289, filed on Mar. 3, 2004, now Pat. No. 7,347,011.

(51) **Int. Cl.**  
**A23D 1/00** (2006.01)

(52) **U.S. Cl.** **12/146 C; 36/45**

(58) **Field of Classification Search** **12/146 C; 12/142 G; 36/45, 10, 55, 3 A**  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**  
1,597,934 A 8/1926 Simpson  
1,888,172 A 6/1932 John  
1,992,780 A 3/1933 Glendon et al.

1,916,251 A 5/1931 John  
2,001,205 A 5/1935 Walker  
2,047,724 A 5/1936 Zuckerman  
2,547,897 A 11/1956 Glendon  
2,514,898 A 3/1951 McDonald  
2,530,896 A 9/1951 Busch  
2,600,692 A 5/1956 Garbutt  
2,607,237 A \* 4/1959 Shorsan et al. 12/142 G  
2,538,675 A 1/1951 Donohue  
2,586,045 A 2/1952 Ilina  
2,641,004 A 6/1953 Roman et al.

**FOREIGN PATENT DOCUMENTS**

CN 1067506 1/1993  
(Continued)

**OTHER PUBLICATIONS**

National S.p.A. publication: Knitting Wear, SMB Top 1 (7 pages).

(Continued)

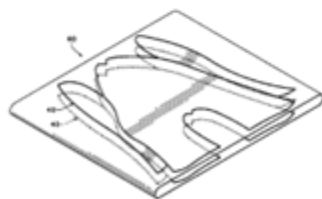
**Primary Examiner — Marie Patterson**

(74) **Attorney, Agent, or Firm —** Banner & Witcoff, Ltd.

(57) **ABSTRACT**

An article of footwear and a method of manufacturing the article of footwear are disclosed. The footwear may include an upper and a sole structure. The upper incorporates a textile element with edges that are joined together to define at least a portion of a void for receiving a foot. The textile element may also have a first area and a second area with a unitary construction. The first area is formed of a first stitch configuration, and the second area is formed of a second stitch configuration that is different from the first stitch configuration to impart varying textures to a surface of the textile element. Various warp knitting or weft knitting processes may be utilized to form the textile element.

**21 Claims, 12 Drawing Sheets**



1. A method of manufacturing an article of footwear, the method comprising:  
simultaneously knitting a textile element with a surrounding textile structure, the knitted textile element having at least one knitted texture that differs from a knitted texture in the surrounding knitted textile structure;  
removing the knitted textile element from the surrounding knitted textile structure;  
incorporating the knitted textile element into the article of footwear.

'511

(12) **United States Patent**  
**Dua et al.**

(36) **Patent No.:** US 9,918,511 B2  
(45) **Date of Patent:** \*Mar. 20, 2018

(54) **ARTICLE OF FOOTWEAR HAVING A TEXTILE UPPER**

(71) **Applicant:** NIKE, Inc., Beaverton, OR (US)

(72) **Inventors:** Bhupesh Dua, Portland, OR (US); Edward Nathaniel Thomas, Portland, OR (US)

(73) **Assignee:** NIKE, Inc., Beaverton, OR (US)

(\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.  
This patent is subject to a terminal disclaimer.

(21) **Appl. No.:** 15/644,587

(22) **Filed:** Jul. 31, 2017

(65) **Prior Publication Data**  
US 2017/032553 A1 Nov. 16, 2017

**Related U.S. Application Data**  
(90) Continuation of application No. 15/510,089, filed on May 31, 2017, which is a continuation of application (Continued)

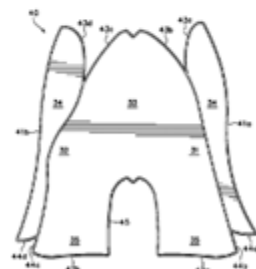
(51) **Int. Cl.**  
**A41B 1/04** (2006.01)  
**A41B 9/02** (2006.01)  
(Continued)

(52) **U.S. Cl.**  
CPC ..... **A41B 1/04** (2013.01); **A41B 5/085** (2013.01); **A41B 9/02** (2013.01); **A41B 23/027** (2013.01)  
(Continued)

(58) **Field of Classification Search**  
CPC ..... **A41B 1/04**; **A41B 23/00**; **A41B 23/025**; **A41B 23/0255**; **A41B 23/04**; **A41B 7/06**; **A41B 7/08**; **A41B 7/085**  
(Continued)

(56) **References Cited**  
**U.S. PATENT DOCUMENTS**  
691,892 A 3/198 Woodside  
761,528 A 5/1994 Mathew  
(Continued)  
**FOREIGN PATENT DOCUMENTS**  
DE 472063 3/1993  
DE 1004173 6/1963  
(Continued)  
**OTHER PUBLICATIONS**  
Burdell, P., "Grid Design Assets", Design, Inc. 1989, 4 pages.  
(Continued)  
**Primary Examiner** — Marie Bays  
(74) **Attorney, Agent, or Firm** — Shook, Hardy & Bacon, L.L.P.  
(57) **ABSTRACT**  
An article of footwear and a method of manufacturing the article of footwear are disclosed. The footwear may include an upper and a sole structure. The upper incorporates a textile element with edges that are joined together to define at least a portion of a void for securing a foot. The textile element may have a first area with a first property and a second area with a second property. Various warp or weft knitting processes, including flat knitting, may be utilized to form the textile element.

20 Claims, 12 Drawing Sheets



1. An upper for an article of footwear, the upper comprising:

a flat knit textile element comprising (1) flat knit edges free of surrounding textile structure such that the flat knit edges are not surrounded by textile structure from which the textile element must be removed, at least one flat knit edge being a curved flat knit edge, and (2) a first knit strip having a first property and a second knit strip having a second property that is different from the first property;

wherein the first knit strip and the second knit strip are positioned adjacent to each other along one or more of a lateral side and a medial side of the upper.



US 9,060,562 B2

'562

(12) **United States Patent**  
**Meir et al.**(30) **Patent No.:** **US 9,060,562 B2**  
(45) **Date of Patent:** **Jun. 23, 2015**(54) **METHOD OF KNITTING A KNITTED COMPONENT WITH AN INTEGRAL KNIT TONGUE**(71) Applicant: **Nike, Inc.**, Beaverton, OR (US)(72) Inventors: **Adrian Meir**, Portland, OR (US);  
**Daniel A. Podhajny**, Beaverton, OR (US);  
**Daren P. Tatler**, Hillsboro, OR (US)(73) Assignee: **NIKE, Inc.**, Beaverton, OR (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 141 days.

(21) Appl. No.: **13/781,551**(22) Filed: **Feb. 26, 2013**(65) **Prior Publication Data**  
US 2013/0239625 A1 Sep. 19, 2013**Related U.S. Application Data**  
(63) Continuation-in-part of application No. 13/400,511, filed on Feb. 20, 2012, now Pat. No. 8,448,474.(51) **Int. Cl.**  
**D04B 7/30** (2006.01)  
**A43B 1/04** (2006.01)  
(Continued)(52) **U.S. Cl.**  
CPC: **A43B 1/04** (2013.01); **D04B 1/24** (2013.01);  
**A43B 24/0245** (2013.01); **A43B 24/0245**  
(2013.01); **A43B 23/26** (2013.01); **D04B 1/22**  
(2013.01); **D04B 15/56** (2013.01); **D10B**  
**2405/02411** (2013.01); **D10B 2405/012**  
(2013.01); **D10B 2405/043** (2013.01); **A43B**  
**24/0205** (2013.01); **D04B 7/28** (2013.01);  
**D10B 2405/0113** (2013.01)(58) **Field of Classification Search**  
CPC: **D04B 1/24**; **D04B 2405/043**; **D04B**  
**2405/012**; **A43B 1/04**; **A43B 23/0245**; **A43B**  
**23/26**  
USPC: **66/168 R**, 170, 171, 177; 2/3 R, 3 A, 84,  
2/114, 47  
See application file for complete search history.(56) **References Cited**

U.S. PATENT DOCUMENTS

681,192 A 3/1898 Woodside  
1,215,198 A 2/1917 Roberts  
(Continued)

FOREIGN PATENT DOCUMENTS

CN 1782156 6/2006  
CN 102271508 12/2011  
(Continued)

OTHER PUBLICATIONS

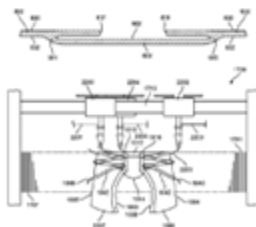
Declaration of Dr. Edward C. Frederick from the US Patent and  
Trademark Office Inter Patent Review of US Patent No. 7,347,013  
(179 pgs.)  
(Continued)

Primary Examiner — Danny Worell

(74) **Attorney, Agent, or Firm** — Plattner Law Group, LLC(57) **ABSTRACT**

Methods of manufacturing a knitted component for an article of footwear that include knitting an upper with an integral knit tongue during a knitting process on a knitting machine are described. The knitting process forms the integral knit tongue of unitary knit construction with the upper so that the integral knit tongue extends through a throat area of the knitted component. The integral knit tongue can include raised elements formed of unitary knit construction with the tongue.

23 Claims, 28 Drawing Sheets



# (54) METHOD OF KNITTING A KNITTED COMPONENT WITH AN INTEGRAL KNIT TONGUE





wherein the integral knit tongue is joined by knitting with the knitting machine to: (1) a forward portion of the throat area, and (2) at least along a portion of both of a lateral side and a medial side of the throat area of the knitted component extending through a portion of a length of the throat area in a longitudinal direction from the forward portion to an ankle opening of the upper.



'636

(12) **United States Patent**  
Dua et al.

(30) **Patent No.:** US 9,510,636 B2  
(45) **Date of Patent:** Dec. 6, 2016

(54) **ARTICLE OF FOOTWEAR  
INCORPORATING A KNITTED  
COMPONENT WITH AN INTEGRAL KNIT  
TONGUE**

(71) Applicant: **Nike, Inc.**, Beaverton, OR (US)

(72) Inventors: **Bhupesh Dua**, Portland, OR (US);  
**Bruce Haffa**, Folsom, CA (US); **Adrian  
Meir**, Portland, OR (US); **Benjamin A.  
Shaffer**, Portland, OR (US)

(73) Assignee: **NIKE, Inc.**, Beaverton, OR (US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 700 days.

(21) Appl. No.: 13/781,525

(22) Filed: Feb. 26, 2013

(65) **Prior Publication Data**  
US 2013/0239438 A1 Sep. 19, 2013

**Related U.S. Application Data**  
(63) Continuation-in-part of application No. 13/474,531,  
filed on May 17, 2012, now Pat. No. 8,621,891, which  
(Continued)

(51) **Int. Cl.**  
**D04B 1/22** (2006.01)  
**A41B 1/04** (2006.01)  
(Continued)

(52) **U.S. Cl.**  
CPC: **A41B 1/04** (2013.01); **A41B 23/0205**  
(2013.01); **A41B 23/0245** (2013.01);  
(Continued)

(58) **Field of Classification Search**  
CPC: **D04B 1/126**; **D04B 1/22**; **D04B 1/24**;  
**D04B 7/24**; **D04B 15/56**  
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

601,432 A 3/1998 Wiedtke  
1,215,199 A 2/1997 Robinson  
(Continued)

FOREIGN PATENT DOCUMENTS

CN 1317061 10/2001  
CN 1782156 6/2006  
(Continued)

OTHER PUBLICATIONS

Towans Office Action dated Nov. 14, 2014 in Towans Patent  
Application No. 102/105789.  
International Preliminary Report on Patentability (including Written  
Opinion of the ISA) mailed Sep. 4, 2014 in International Applica-  
tion No. PCT/US2013/02608.  
Non-Final Office Action mailed Dec. 19, 2012 in U.S. Appl. No.  
13/474,531.  
(Continued)

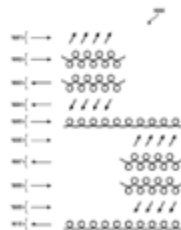
**Primary Examiner**—Daisy Wierell

(74) **Attorney, Agent, or Firm**—Heide Gibson & Liscio

(57) **ABSTRACT**

Articles of footwear are described that incorporate a knitted  
component that has an upper and an integral knit tongue. The  
integral knit tongue is formed of unitary knit construction  
with the upper and extends through a throat area of the  
knitted component. The integral knit tongue includes raised  
elements formed of unitary knit construction with the  
tongue. Methods of manufacturing a knitted component for  
an article of footwear may include knitting the upper and the  
integral knit tongue during a knitting process on a knitting  
machine.

27 Claims, 28 Drawing Sheets



# (54) ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH AN INTEGRAL KNIT TONGUE



'636

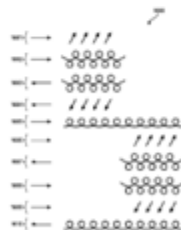
**United States Patent**  
**Dua et al.**(30) Patent No.: **US 9,510,636 B2**  
(45) Date of Patent: **Dec. 6, 2016**(54) **ARTICLE OF FOOTWEAR INCORPORATING A KNITTED COMPONENT WITH AN INTEGRAL KNOT TONGUE**(71) Applicant: **Nike, Inc.**, Beaverton, OR (US)(72) Inventors: **Ritesh D. Dua**, Portland, OR (US); **Bruce H. Hall**, Folsom, CA (US); **Adrian M. Meir**, Portland, OR (US); **Benjamin A. Shaffer**, Portland, OR (US)(73) Assignee: **NIKE, Inc.**, Beaverton, OR (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 700 days.

(21) Appl. No.: **13/781,525**(22) Filed: **Feb. 26, 2013**(65) **Prior Publication Data**  
US 2013/0239438 A1 Sep. 19, 2013**Related U.S. Application Data**  
(63) Continuation-in-part of application No. 13/474,531, filed on May 17, 2012, now Pat. No. 8,621,891, which (Continued)(51) **Int. Cl.**  
**D04B 1/22** (2006.01)  
**A41B 1/04** (2006.01)  
(Continued)(52) **U.S. Cl.**  
CPC: **A41B 1/04** (2013.01); **A41B 23/0295** (2013.01); **A41B 23/0245** (2013.01); (Continued)(58) **Field of Classification Search**  
CPC: **D04B 1/126**; **D04B 1/22**; **D04B 1/24**; **D04B 7/24**; **D04B 15/56**  
See application file for complete search history.**References Cited**  
**U.S. PATENT DOCUMENTS**681,432 A 3/1908 Wiedersheim  
1,215,198 A 2/1917 Robinson  
(Continued)**FOREIGN PATENT DOCUMENTS**CN 1317061 10/2001  
CN 1782156 6/2006  
(Continued)**OTHER PUBLICATIONS**Tennessee Office Action dated Nov. 14, 2014 in Tennessee Patent Application No. 102107309.  
International Preliminary Report on Patentability (including Written Opinion of the ISA) mailed Sep. 4, 2014 in International Application No. PCT/US2013/026018.  
Non-Final Office Action mailed Dec. 19, 2012 in U.S. Appl. No. 13/474,531.  
(Continued)**Primary Examiner**—Daisy Wierell(74) **Attorney, Agent, or Firm**—Heide Gilson & Liscio**ABSTRACT**

Articles of footwear are described that incorporate a knitted component that has an upper and an integral knit tongue. The integral knit tongue is formed of unitary knit construction with the upper and extends through a throat area of the knitted component. The integral knit tongue includes raised elements formed of unitary knit construction with the tongue. Methods of manufacturing a knitted component for an article of footwear may include knitting the upper and the integral knit tongue during a knitting process on a knitting machine.

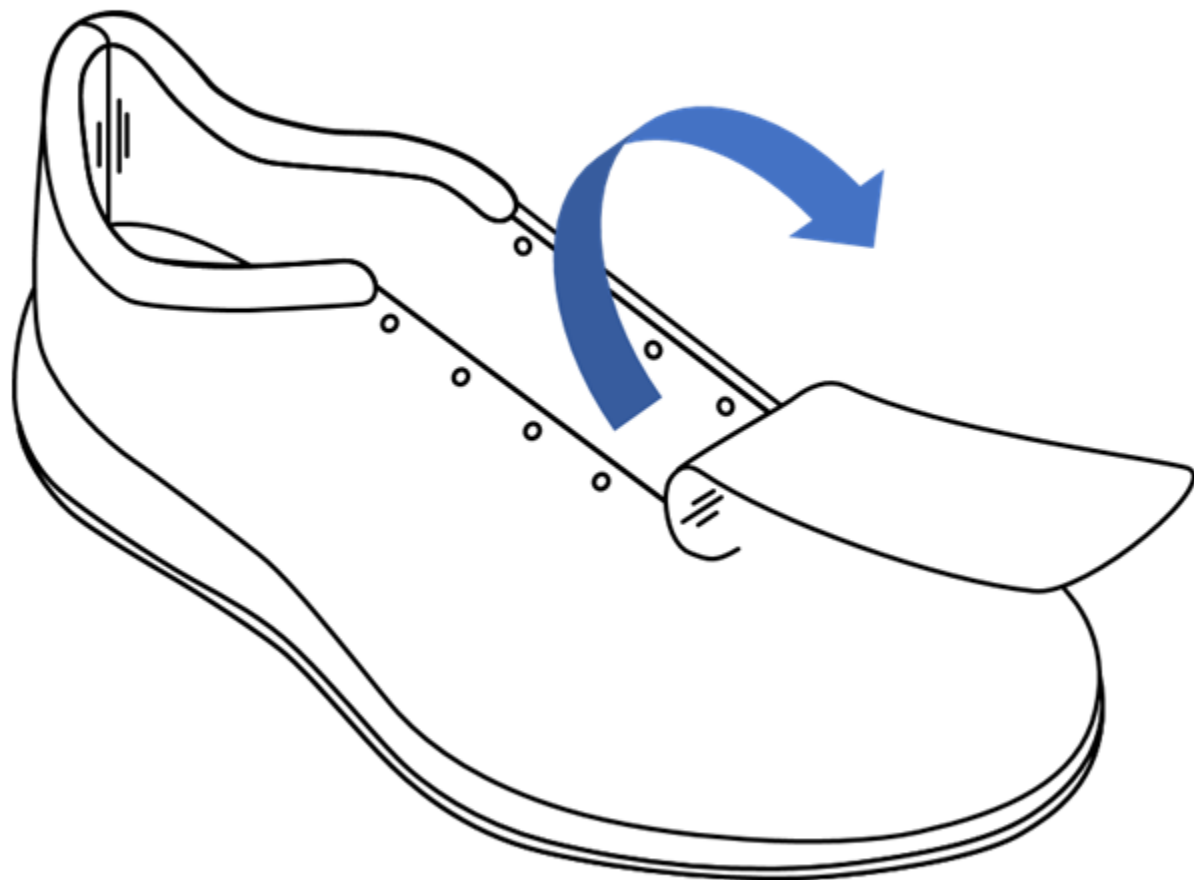
27 Claims, 28 Drawing Sheets



1. An article of footwear having an upper and a sole structure secured to the upper, the article of footwear incorporating a knitted component comprising:

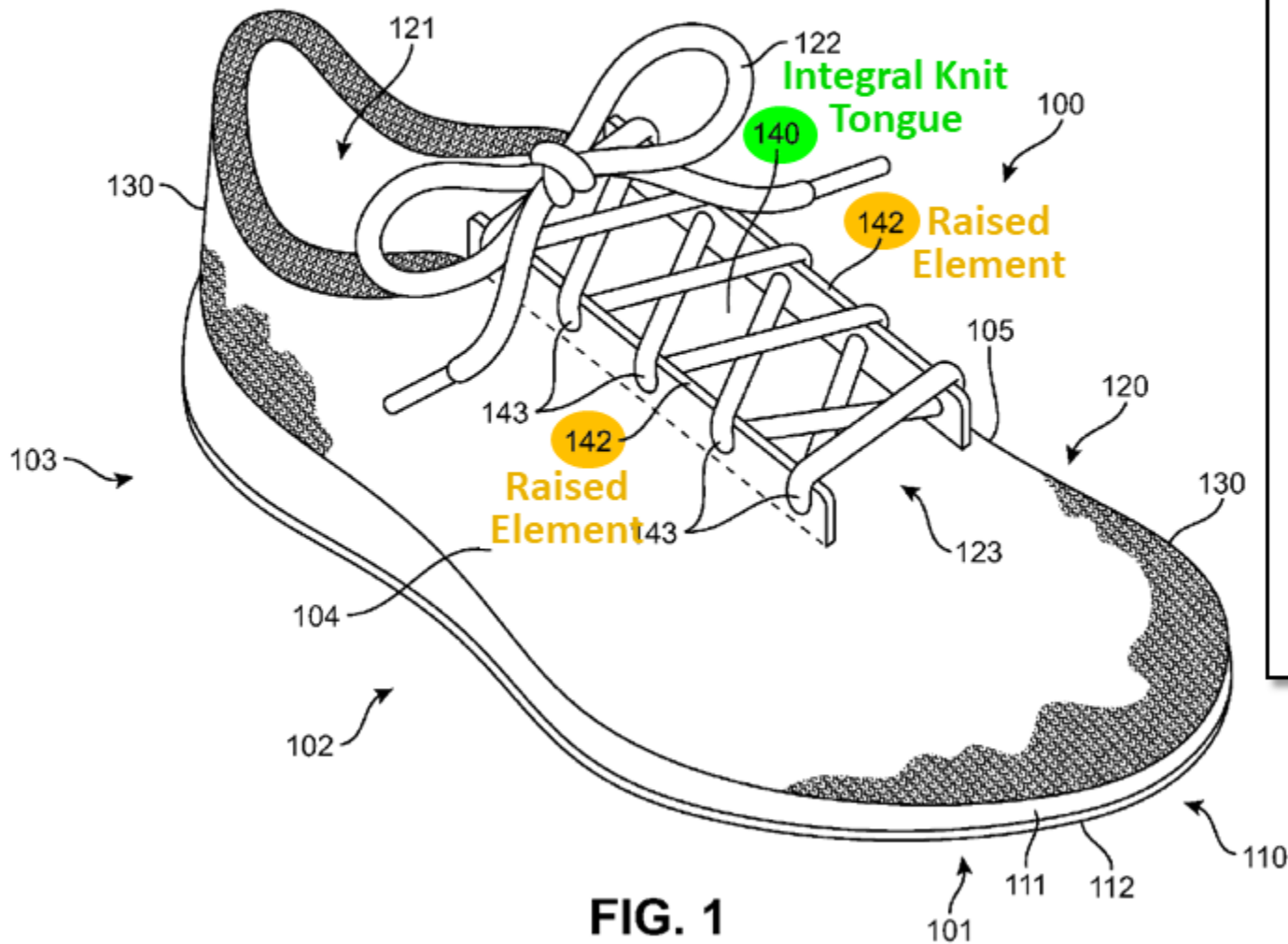
a portion of the knitted component defining the upper, the upper including a portion of at least one of an exterior surface of the knitted component and an opposite interior surface of the knitted component, the interior surface defining a void for receiving a foot; and an integral knit tongue formed with the upper and extending through a throat area of the knitted component; and at least one raised element extending a height above the exterior surface of the knitted component, wherein the integral knit tongue is joined to a forward portion of the throat area and at least along a portion of a lateral side and a medial side of the throat area of the knitted component extending from the forward portion to an ankle opening of the upper.

## What Is A Tongue?



“[In a conventional article of footwear], the upper may include a tongue that extends under the lacing system to enhance adjustability of the footwear...”

## Exemplar "Integral Knit" Tongue



"In an exemplary embodiment, an integral knit tongue 140 is formed of unitary knit construction with upper 120 and extends through throat area 123 of upper 120 between lateral side 104 and medial side 105. A lace 122 extends through various lace apertures 143 in raised elements 142 of integral knit tongue 140 ...."

# Knitting An Integral Knit Tongue

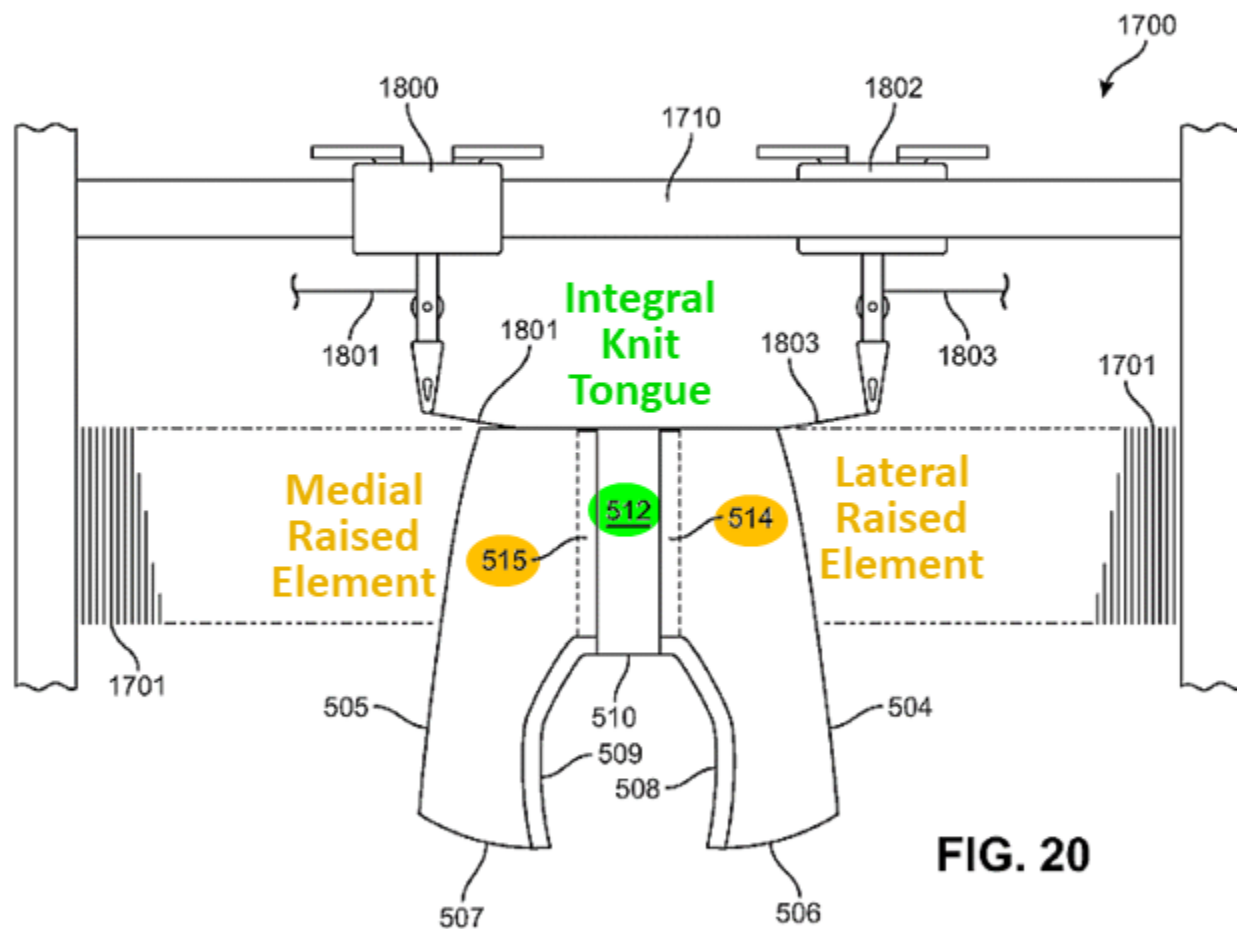
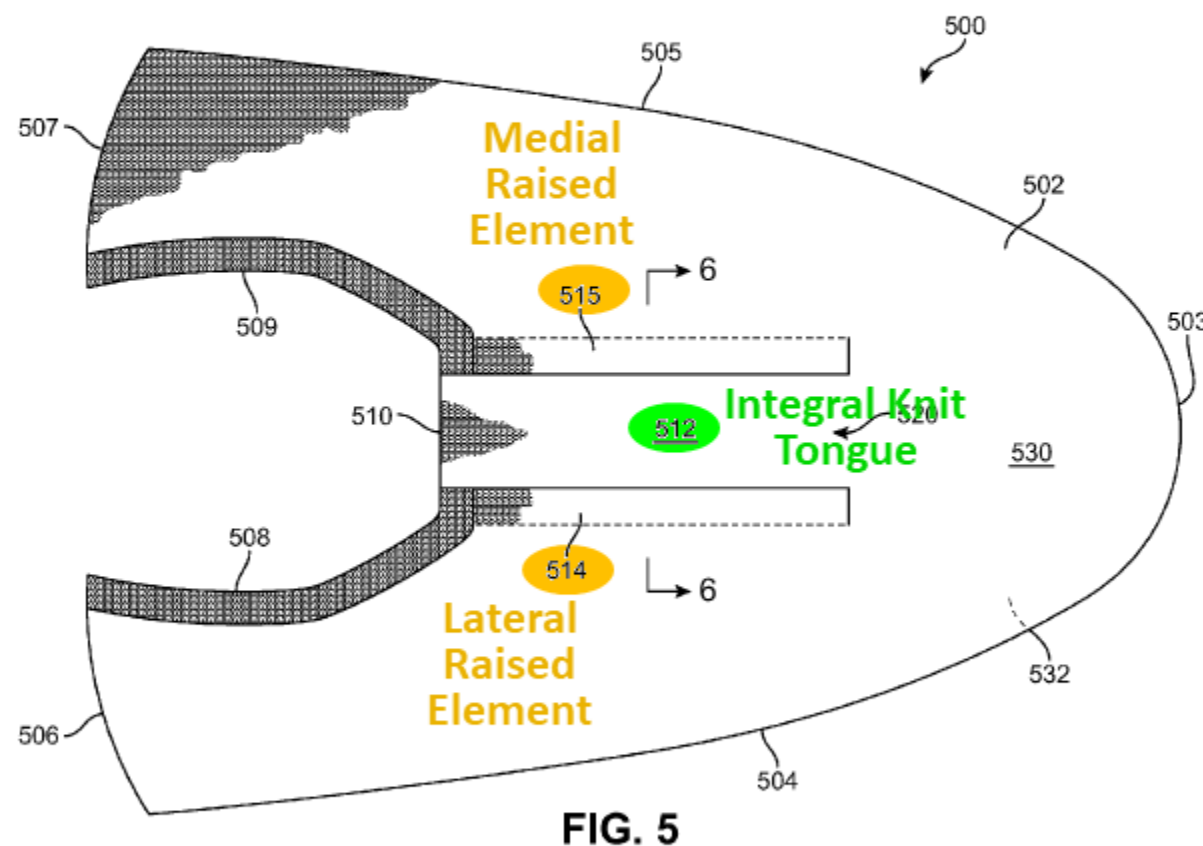


FIG. 20

“FIG. 20 illustrates knitting machine **1700** completing the courses associated with knitting **integral knit tongue 512**, **lateral raised element 514**, **medial raised element 515**, and a portion of the rest of first knitted component **500** forming upper **502**.”



“In some embodiments, integral knit tongue **512** may include raised elements disposed on opposite sides of throat area **520** and extending along the length of integral knit tongue **512** .... As shown in FIG. 5, integral knit tongue **512** includes a lateral raised element **514** and a medial raised element **515**.”

## Cross-Section Showing Integral Knit Tongue With Raised Elements

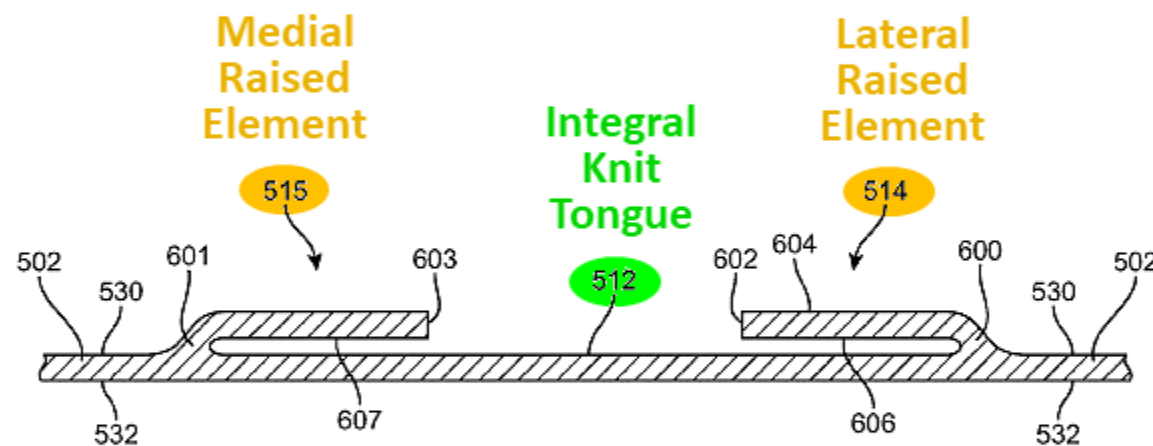
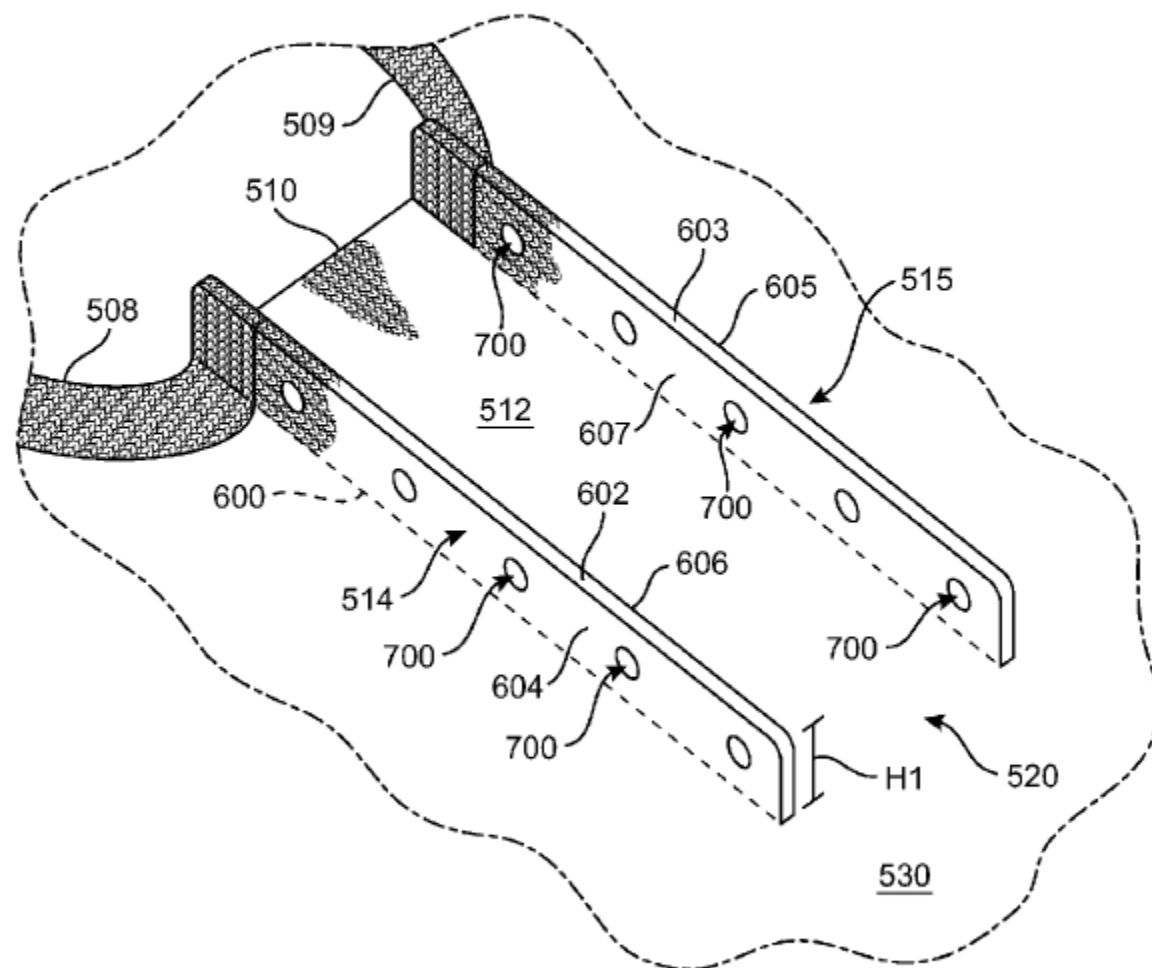


FIG. 6

“Referring now to FIG. 6, a cross-sectional view of **integral knit tongue 512** is illustrated. ... [A]s shown in FIG. 6, **lateral raised element 514** and **medial raised element 515** are shown in a *flat* configuration such that first inward facing side **606** and/or second inward facing side **607** is oriented towards first surface **530**.”



**FIG. 7**

“In various embodiments, however, raised elements, including lateral raised element **514** and medial raised element **515**, may be positioned in an upright configuration. Referring now to FIG. 7, lateral raised element **514** and medial raised element **515** are shown in an upright configuration ....”



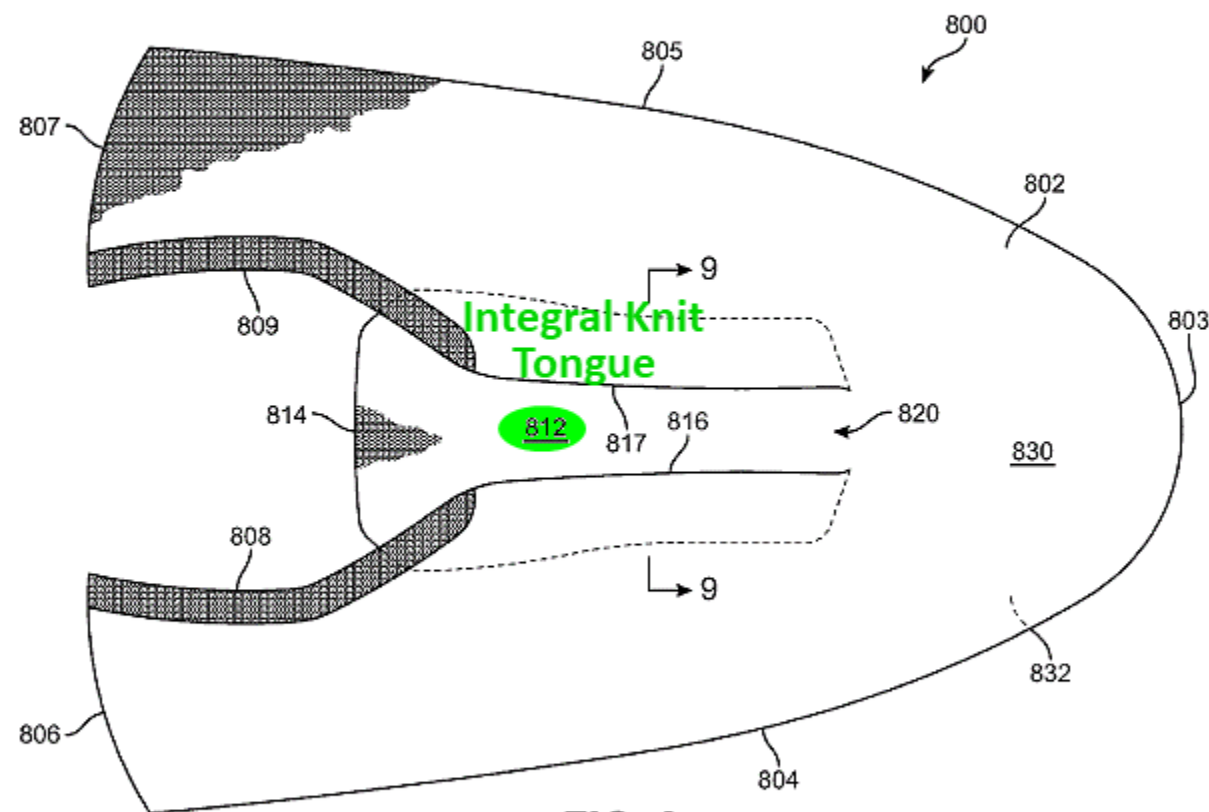
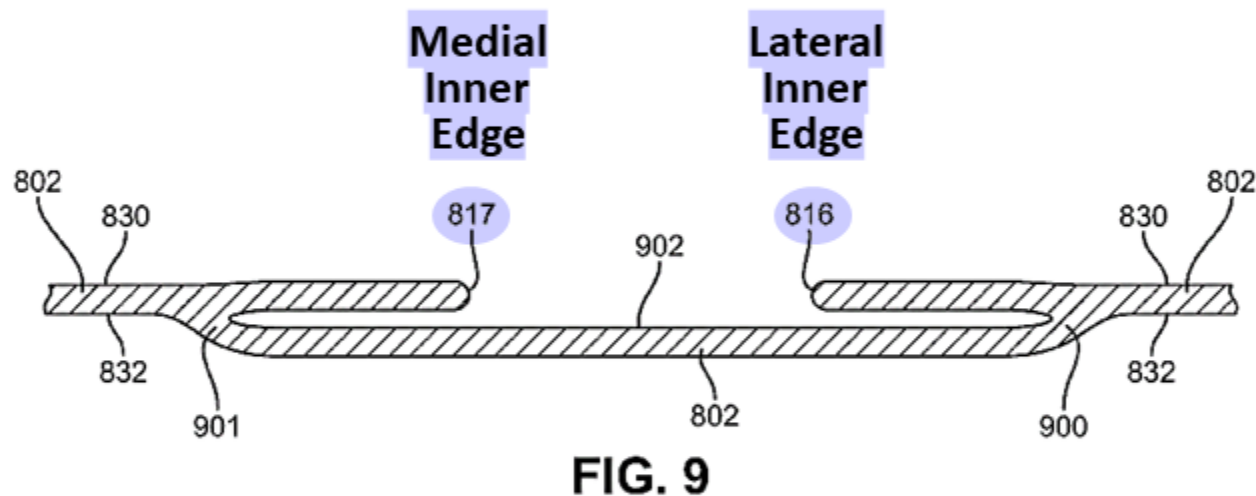


FIG. 8

“In an exemplary embodiment, integral tongue **812** of second knitted component **800** does not include raised elements. ... [S]econd knitted component **800** includes a portion of upper **802** that extends over **integral knit tongue 812** to form a lateral inner edge **816** and a medial inner edge **817**.”

# Cross-Section Showing Integral Knit Tongue Without Raised Elements



“Referring now to FIG. 9, a cross-sectional view of integral knit tongue **812** is illustrated. ... In this embodiment, first edge **900** and second edge **902** of integral knit tongue **812** are joined with second surface **832** of upper **802** such that integral knit tongue **812** extends below lateral inner edge **816** and medial inner edge **817** of upper **802**.”



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(54) **ARTICLE OF FOOTWEAR HAVING A FLAT  
KNIT UPPER CONSTRUCTION OR OTHER  
UPPER CONSTRUCTION**

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**A43B 1/04** (2006.01)

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**A43B 1/00** (2006.01)

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A43B 18/68; A43B 18/70; A43B 18/72; A43B 18/74; A43B 18/76; A43B 18/78; A43B 18/80; A43B 18/82; A43B 18/84; A43B 18/86; A43B 18/88; A43B 18/90; A43B 18/92; A43B 18/94; A43B 18/96; A43B 18/98; A43B 19/00; A43B 19/02; A43B 19/04; A43B 19/06; A43B 19/08; A43B 19/10; A43B 19/12; A43B 19/14; A43B 19/16; A43B 19/18; A43B 19/20; A43B 19/22; A43B 19/24; A43B 19/26; A43B 19/28; A43B 19/30; A43B 19/32; A43B 19/34; A43B 19/36; A43B 19/38; A43B 19/40; A43B 19/42; A43B 19/44; A43B 19/46; A43B 19/48; A43B 19/50; A43B 19/52; A43B 19/54; A43B 19/56; A43B 19/58; A43B 19/60; A43B 19/62; A43B 19/64; A43B 19/66; A43B 19/68; A43B 19/70; A43B 19/72; A43B 19/74; A43B 19/76; A43B 19/78; A43B 19/80; A43B 19/82; A43B 19/84; A43B 19/86; A43B 19/88; A43B 19/90; A43B 19/92; A43B 19/94; A43B 19/96; A43B 19/98; A43B 20/00; A43B 20/02; A43B 20/04; A43B 20/06; A43B 20/08; A43B 20/10; A43B 20/12; A43B 20/14; A43B 20/16; A43B 20/18; A43B 20/20; A43B 20/22; A43B 20/24; A43B 20/26; A43B 20/28; A43B 20/30; A43B 20/32; A43B 20/34; A43B 20/36; A43B 20/38; A43B 20/40; A43B 20/42; A43B 20/44; A43B 20/46; A43B 20/48; A43B 20/50; A43B 20/52; A43B 20/54; A43B 20/56; A43B 20/58; A43B 20/60; A43B 20/62; A43B 20/64; A43B 20/66; A43B 20/68; A43B 20/70; A43B 20/72; A43B 20/74; A43B 20/76; A43B 20/78; A43B 20/80; A43B 20/82; A43B 20/84; A43B 20/86; A43B 20/88; A43B 20/90; A43B 20/92; A43B 20/94; A43B 20/96; A43B 20/98; A43B 21/00; A43B 21/02; A43B 21/04; A43B 21/06; A43B 21/08; A43B 21/10; A43B 21/12; A43B 21/14; A43B 21/16; A43B 21/18; A43B 21/20; A43B 21/22; A43B 21/24; A43B 21/26; A43B 21/28; A43B 21/

# '484 Patent Discloses Using Flat Knitting To Form 3D Structures

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'484

(12) **United States Patent**  
Dua et al.

(10) **Patent No.:** US 9,730,484 B2  
(45) **Date of Patent:** Aug. 15, 2017

(54) **ARTICLE OF FOOTWEAR HAVING A FLAT KNIT UPPER CONSTRUCTION OR OTHER UPPER CONSTRUCTION**

(71) **Applicant:** NIKE, Inc., Beaverton, OR (US)

(72) **Inventors:** Bhupesh Dua, Portland, OR (US); Edward N. Thomas, Portland, OR (US)

(73) **Assignee:** NIKE, Inc., Beaverton, OR (US)

(\*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 671 days.

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(58) **Field of Classification Search**  
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**References Cited**  
U.S. PATENT DOCUMENTS  
604,082 A 3/1908 Woodside  
1,215,898 A 2/1917 Rothstein  
(Continued)

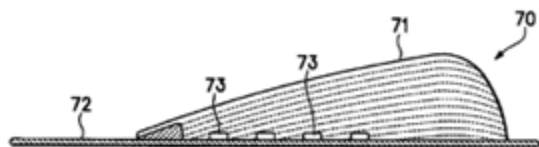
**FOREIGN PATENT DOCUMENTS**  
CN 1925763 A 3/2007  
296536081 A 8/2010  
(Continued)

**OTHER PUBLICATIONS**  
European Search Report from corresponding European Application No. 13160417.2, dated Sep. 7, 2015 (7 pages); (Continued)

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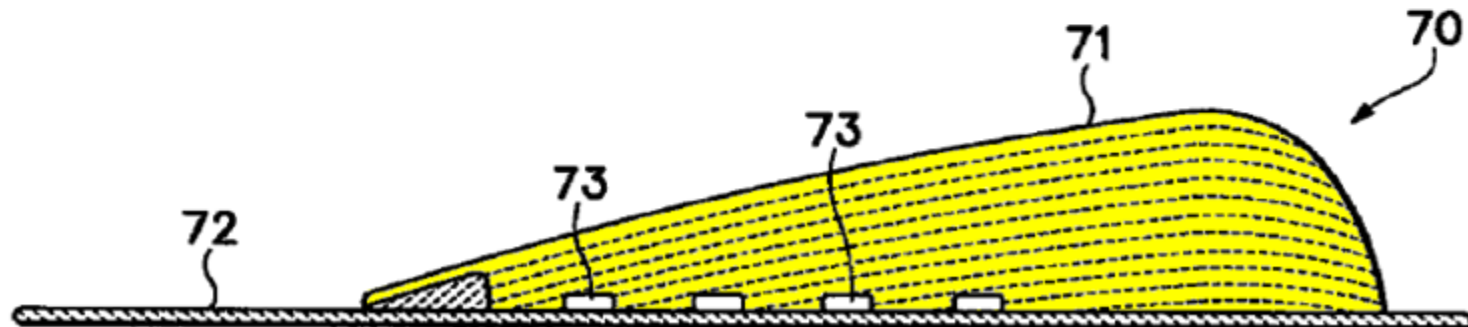
(57) **ABSTRACT**  
Flat knitting allows production of textile structures (e.g., for use in footwear uppers) of a final desired shape such that textile cutting steps can be avoided. Flat knitted elements also can be formed directly in desired three dimensional shapes, which can help avoid the need to use additional support structures (e.g., in footwear construction). By selectively placing multiple different yarns and/or stitch patterns at multiple different locations in the overall structure during the knitting process, flat knitted products may have multiple different physical properties (e.g., different stretchability, different moisture management capabilities, etc.) at multiple different locations or zones within a single, unitary construction (e.g., different properties at different zones or locations within a single footwear structure). Additionally, flat knitting can be used to produce pockets, tunnels, or other layered structures in the final product.

**19 Claims, 18 Drawing Sheets**



“An advantage of flat knitting is that generally three-dimensional structures may be formed.”

“[C]entral portion **71** has a domed shape.... That is, the flat knitting process forms central portion **71** to have a three-dimensional structure that is shaped to extend over the foot.”





'484

(12) **United States Patent**  
Dua et al.

(16) **Patent No.:** US 9,730,484 B2  
(45) **Date of Patent:** Aug. 15, 2017

(54) **ARTICLE OF FOOTWEAR HAVING A FLAT KNIT UPPER CONSTRUCTION OR OTHER UPPER CONSTRUCTION**

(71) Applicant: NIKE, Inc., Beaverton, OR (US)

(72) Inventors: Bhupesh Dua, Portland, OR (US); Edward N. Thomas, Portland, OR (US)

(73) Assignee: NIKE, Inc., Beaverton, OR (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 671 days.

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(52) **U.S. Cl.**

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(58) **Field of Classification Search**

CPC — D04B 7/36; D04B 7/34; D04B 7/28; D04B 1/24; D04B 1/26; D04B 7/32; (Continued)



(56) **References Cited**  
U.S. PATENT DOCUMENTS

904,042 A 5/1988 Woodlake

1,215,898 A 2/1917 Rothman (Continued)

**FOREIGN PATENT DOCUMENTS**

CN 1925763 A 3/2005

CN 200736081 U 8/2010 (Continued)

**OTHER PUBLICATIONS**

European Search Report from corresponding European Application No. 13184417.2, dated Sep. 7, 2015 (7 pages); (Continued)

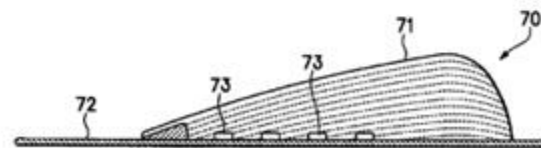
**Primary Examiner** — Danny Worell

(74) **Attorney, Agent, or Firm** — Andrew A. Hofford; Brinks, Gibson & Lerner

(57) **ABSTRACT**

Flat knitting allows production of textile structures (e.g., for use in footwear uppers) of a final desired shape such that textile cutting steps can be avoided. Flat knitted elements also can be formed directly in desired three-dimensional shapes, which can help avoid the need to use additional support structures (e.g., in footwear construction). By selectively placing multiple different yarns and/or stitch patterns at multiple different locations in the overall structure during the knitting process, flat knitted products may have multiple different physical properties (e.g., different stretchability, different moisture management capabilities, etc.) at multiple different locations or zones within a single, unitary construction (e.g., different properties at different zones or locations within a single footwear structure). Additionally, flat knitting can be used to produce pockets, tunnels, or other layered structures in the final product.

19 Claims, 18 Drawing Sheets



1. An article of footwear comprising an upper including a flat-knitted element formed from at least one yarn mechanically manipulated in a flat-knitting process, the flat-knitted element including a first layer having:

a central portion having a domed, three-dimensional structure configured for extending over the top of a foot;

a first side portion being formed of unitary construction with the central portion and extending from a first side of the central portion; and

a second side portion being formed of unitary construction with the central portion and extending from a second side opposite the first side of the central portion, the domed, three-dimensional structure shaped to extend above the plane of the first side portion and the second side portion when the flat-knitted element is in a flattened configuration.